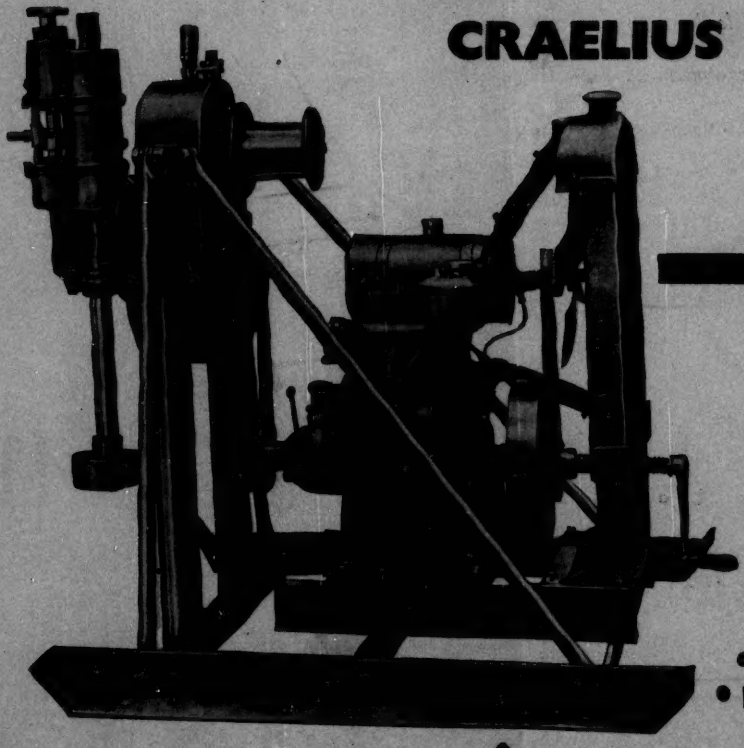
The Mining Journal

Established 1835 — Railway & Commercial Gazette

Vol. CCXL No. 6131 — LONDON, FEBRUARY 20, 1953 — PRICE 8d

A NEW DIAMOND CORE AND BLAST HOLE DRILL

CRAELIUS — TYPE XC-42



- CAPACITY - 330 feet
- BLAST HOLE DIAMETERS up to 2¼ inches
- CORE DIAMETERS up to 2 7/16 inches
- POWER: DIESEL, PETROL, AIR OR ELECTRIC
- MOUNTING: "A" FRAME FOR SURFACE (Double Column for Underground)
- SPINDLE SPEEDS from 300 r.p.m. to 2,500 r.p.m.

Craelius

CRAELIUS COMPANY LIMITED, 12 CLARGES STREET, LONDON, W.1

Telephone: Grosvenor 1378/9
Telegrams: Craelius, London

Associated Companies
THE SWEDISH DIAMOND ROCK DRILLING CO., STOCKHOLM
THE CRAELIUS EAST AFRICAN DRILLING CO. LTD., NAIROBI
THE ELECTRICAL PROSPECTING CO., STOCKHOLM
SOCIETE ANONYME CRAELIUS, PARIS

Refined soft pig lead and lead alloys

processed under close laboratory control.

- *Refined soft pig lead*
- *Chemical lead*
- *Cable Alloys*
- *Antimonial lead*
- *Lead for equipment in radioactive work*
- *Lead and tin powders*

H. J. ENTHOVEN & SONS LTD

MEMBERS OF THE LONDON METAL EXCHANGE

SMELTERS AND REFINERS OF NON-FERROUS METALS FOR OVER 100 YEARS

Head Office: Enthoven House, 89 Upper Thames Street, London, E.C.4

Telephone Number: MANsion House 4533. Telegrams: Enthoven, Phone, London

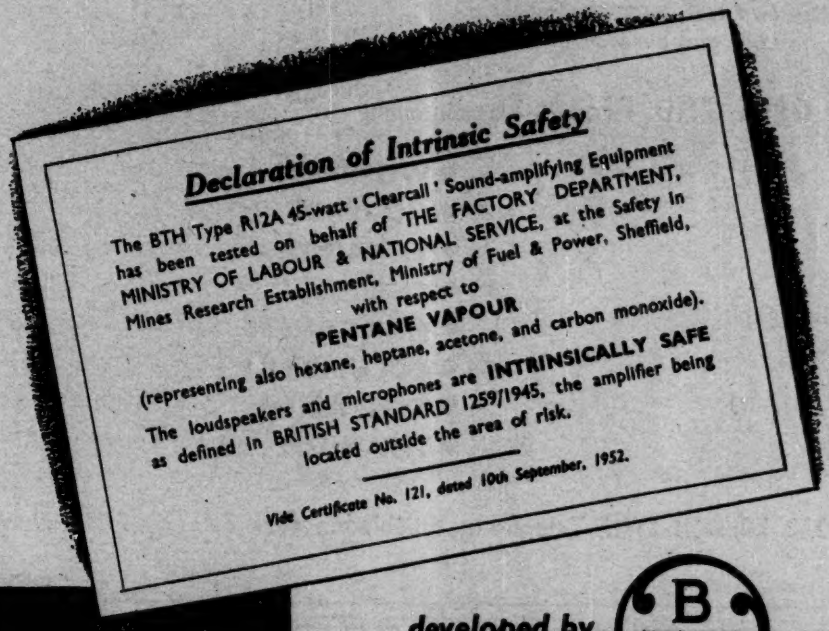
SMELTERS AT ROTHERHITHE, LONDON; AND DARLEY DALE, DERBYSHIRE

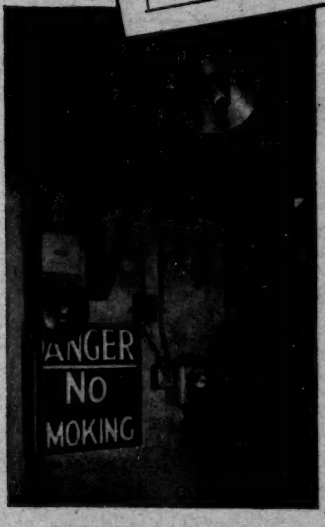
E.3501

FIRST "INTRINSIC SAFETY" CERTIFICATE

goes to CLEARCALL

INDUSTRIAL COMMUNICATION EQUIPMENT


Declaration of Intrinsic Safety
The BTH Type R12A 45-watt 'Clearcall' Sound-amplifying Equipment has been tested on behalf of THE FACTORY DEPARTMENT, MINISTRY OF LABOUR & NATIONAL SERVICE, at the Safety in Mines Research Establishment, Ministry of Fuel & Power, Sheffield, with respect to
PENTANE VAPOUR
(representing also hexane, heptane, acetone, and carbon monoxide).
The loudspeakers and microphones are INTRINSICALLY SAFE as defined in BRITISH STANDARD 1259/1945, the amplifier being located outside the area of risk.
Vide Certificate No. 121, dated 10th September, 1952.



developed by B T-H

"Clearcall" loudspeakers and microphones are the subject of an 'intrinsic safety certificate'—the only equipment of its kind that has ever passed the stringent conditions imposed by the Testing Authority.

★ *Each component designed to withstand the most arduous conditions to be found anywhere.*

★ *Suitable for iron and steel works, rolling mills, etc., paint and varnish factories, chemical works.*

★ *PERFECT INTELLIGIBILITY IN BOTH NOISY AND QUIET SURROUNDINGS.*

THE **BRITISH THOMSON-HOUSTON** COMPANY LIMITED • RUGBY • ENGLAND

Member of the AEI group of companies A4535

Principal Overseas Representatives :

AUSTRALIA, Sydney : Australian General Electric Proprietary Ltd., G.P.O. Box 2517.
Melbourne : Australian General Electric Proprietary Ltd., G.P.O. Box 538F.

CHINA : Hong Kong : Inniss & Riddle (China) Ltd., 1st Floor David House, 67-69, Des Voeux Road Central.

NEW ZEALAND, Wellington : National Electrical & Engineering Co., Ltd., P.O. Box 1055.

INDIA : Associated Electrical Industries (India) Ltd., Calcutta P.O. Box 271, Bombay P.O. Box 484.

PAKISTAN : Associated Electrical Industries (Pakistan) Ltd., Karachi P.O. Box 746, Lahore P.O. Box 146.

SOUTH AFRICA, Johannesburg : The British Thomson Houston Co., (South Africa) (Pty), Ltd., P.O. Box 482.
Capetown : Wilson & Herd Engineering (Pty.)., Ltd., P.O. Box 1459.

WEST AFRICA, Takoradi, Gold Coast, Colony : The West African Engineering Co., P.O. Box 100.

RHODESIA, Bulawayo : Johnson & Fletcher, Ltd., P.O. Box 224.

KENYA COLONY, A. Baumann & Co., Ltd., P.O. Box 538 Nairobi. P.O. Box 323 Mombasa.

TANGANYIKA, A. Baumann & Co., Ltd., P.O. Box 277 Dar-es-Salaam.

UGANDA, A. Baumann & Co., Ltd., P.O. Box 335 Kampala.

and others throughout the world

LONDON & SCANDINAVIAN METALLURGICAL CO LTD

Manufacturing Metallurgists

Buyers for consumption in own and associated works in U.K. and abroad of

ORES AND RESIDUES *containing*

- **WOLFRAM**
- **MOLYBDENUM**
- **VANADIUM**
- **CHROME**
- **MANGANESE**
- **COLUMBIUM**
- **TANTALUM**
- **TITANIUM**

39 HILL ROAD LONDON SW19 Telephone **WIM**bledon **6321** Telegrams Metallurg London

WOLVERHAMPTON DIAMOND DIE & TOOL Co. Ltd.

BOARTS

and

INDUSTRIAL DIAMONDS

Exporters

11 HATTON GARDEN, LONDON, E.C.1

Telephone : **HOLborn 3017** *Cables :* **Pardimon, London**

K. & B.

Ore Testing and Equipment of Milling Plants

KNAPP & BATES

LIMITED

10, Gate St. Kingsway, London, W.C.2

Telephone : **CHA 6770**
Cables : **FLOWSHEET, LONDON**

"Tell 'em they did a great job... and so did Automatic Lubrication!"

Production Target reached and passed! The same story is happening all over the country and a lot of the credit is due to new mining machinery—and to Tecalemit Centralised Lubrication that keeps these machines running faster . . . safer. This lubricating system feeds to every bearing the correct amount of oil or grease at the correct interval of time. Breakdowns and overheating due to faulty lubrication are replaced by the smooth, trouble-free operation that means increased output.

Have you any lubricating problems? If you have, don't hesitate to consult Tecalemit. Remember, a Tecalemit Engineer is ready to 'talk lubrication' anywhere . . . anytime.

TECALEMIT

The Authority on Lubrication

PLYMOUTH, ENGLAND

1377

Cyanide in the
FLOTATION PROCESS

'Cassel' brand sodium cyanide—the purest and most concentrated form of cyanide—is a valuable and indeed often an essential reagent in the differential flotation of base metal ores.

The powerful depressing action of 'Cassel' brand sodium cyanide ensures the production of the highest grade concentrates; the 'cleansing' action ensures maximum mineral recovery.

'Cassel' Brand
SODIUM CYANIDE

Manufactured by:

IMPERIAL CHEMICAL INDUSTRIES LTD., LONDON, S.W.1

ICI

C.C.162

Silver

refining

The handling of silver-bearing materials of relatively low content is one of the specialist services of our refineries. Mining by-products, residues, and electrolytic slimes are treated in large quantities in plant which has an immediate capacity of 1,500,000 oz. weekly. Upon instruction, the refined contents may be marketed or returned in any form desired.

GOLD AND PLATINUM

Our refineries handle also bullion, ores, concentrates, slags, mattes, and mining by-products containing gold and the platinum metals.

Johnson Matthey

SMELTERS AND ASSAYERS TO THE BANK OF ENGLAND

JOHNSON, MATTHEY & CO., LIMITED, HATTON GARDEN, LONDON, E.C.I.

Telephone: HOLborn 6989

R.I.

MANGANESE • CHROME • TUNGSTEN

ANTIMONY • TANTALITE • COLUMBITE

ZINC • LEAD • COPPER

Philipp Brothers, Inc.

70 PINE STREET, New York 5, N. Y. Cables: PHIBRO N. Y.

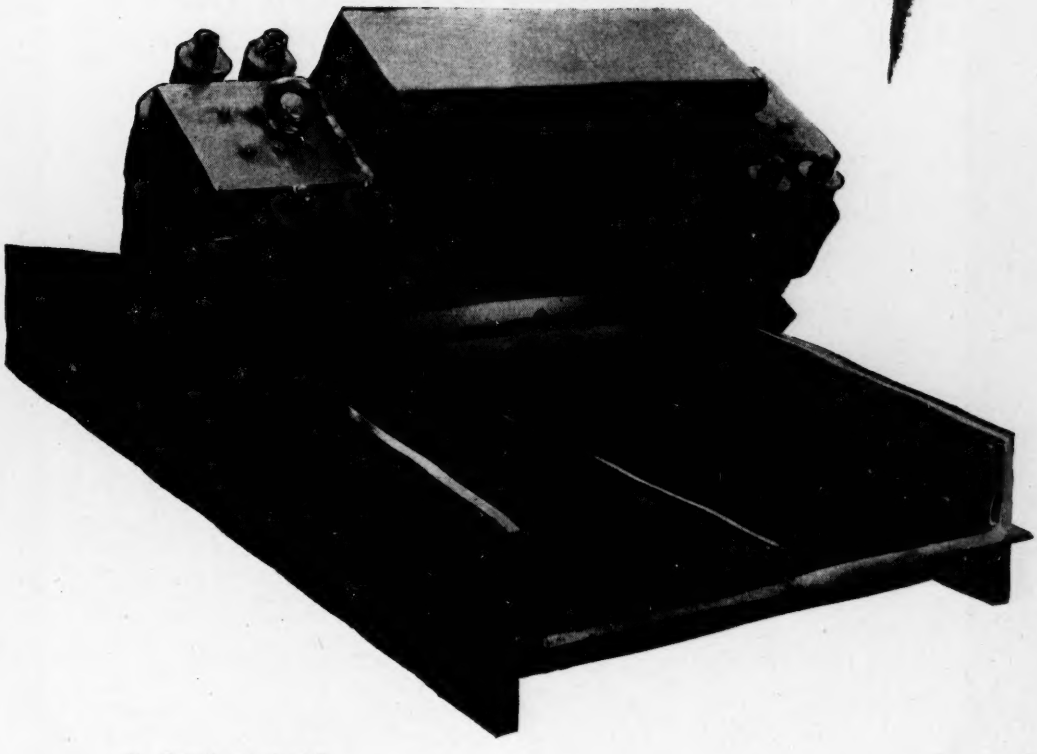
AMSTERDAM • LONDON • MONTREAL • TOKYO • BUENOS AIRES
MONTEVIDEO • LA PAZ • LIMA • CALCUTTA

ORES

METALS

FERRO ALLOYS

Sherwen *Electromagnetic* Vibrating Screens



★ Simple to install
★ No bearings or cams to wear out
★ No parts to grease or oil
★ The vibrating mechanism is totally enclosed, dust proof and damp proof
★ Screencloths can be easily changed and need no special attachments.

FRASER & CHALMERS

ERITH, KENT

Fraser & Chalmers Engineering Works of The General Electric Co., Ltd.

G.E.C. HEAD OFFICE: MAGNET HOUSE, KINGSWAY, LONDON, W.C.2

COMPLEX AND LOW GRADE MATERIALS

containing principally

TIN *or* LEAD

or TIN combined with any of the metals

LEAD COPPER ANTIMONY

BISMUTH *and* SILVER

are purchased outright or treated on toll for return as High Purity elemental metals.

Send us samples or detailed analyses.

CAPPER PASS

& SON LIMITED

BEDMINSTER SMELTING WORKS BRISTOL

The Mining Journal

Established 1835

Vol. CCXL No. 6131 LONDON, FEBRUARY 20, 1953 Price 8d

CONTENTS

Notes and Comments .. .. 209.
From Our Australian Correspondent 211
The Problem of Silver 212
A Preliminary Description of the Nigerian Lead-Zinc Field 214
Cast Basalt Liners for Mining Plant 215
North Norway in 1952 216
Machinery and Equipment 217
Metals, Minerals and Alloys 218
The Mining Markets 220
Company News and Views 221
Messina's Impressive Results; Zams Profits Reduced; Oroville Pays Same; Ariston Pays 30 per cent; Consolidated Murchison's 1952 Results; "Chartered" Grants Tinto Prospecting Rights.
Company Meetings and Announcements 223
British Tin Investment Corporation; Gold Coast Selection Trust Ltd.; Alpine (Barberton) Gold Mine Ltd.; Consolidated Murchison (Transvaal) Goldfields and Development Company Ltd.

Published by The Mining Journal Ltd. at 15, George Street, London, E.C.4. MANsion House 5511 Subscription £2 per annum

NOTES AND COMMENTS

United States Insufficiencies

Mr. Cordell Hull a few years since was strongly criticized in the United States for declaring that the Great Republic was a "have-not" nation. The evolution in the situation, more especially since the Korean involvement developed, had seen the acceptance of his statements, more particularly expressed in the Paley Report, and in the deliberations of the International Materials Conference. The degree of insufficiency has been much canvassed and its over-emphasis criticized, as is perhaps not unnatural in so constantly changing a picture, as world conditions fluctuate. Nevertheless it is not without interest to note the conclusions of the U.S. Defence Production Administration as to the dependency of the country on foreign supplies of the vital base metals. The evolution of the defence programmes towards improved machines with numerical reduction of armies has, of course, exercised an important influence, and the great advances in technology are a natural concomitant. A recent study of the principal requirements of the United States strategical conceptions is summed up somewhat as follows in a recent statement by the Defence Production Administration.

In copper the dependency of the United States on outside countries is said to be 35 per cent, and the world supply inadequate and likely to remain so for several years: for bauxite the dependency is placed at 65 per cent, and world supplies are adequate. Lead dependency is said to be 45 per cent, and supplies should be adequate. In tin the United States is entirely dependent on other Free World countries; while in zinc, supplies of which are adequate for all requirements, United States sufficiency is rated at 35 per cent. For nickel the United States is dependent on other countries to the extent of 99 per cent, and the supplies are critical. In iron ore the U.S. is dependent on other countries only to a small extent—8 per cent—and there are ample supplies available in the world. For manganese the dependency on other countries is placed at 90 per cent and supplies are judged to be inadequate for all requirements. For cobalt there is a deficiency of 90 per cent, with requirements greatly exceeding world supply, though with the expansion of copper production, by-product cobalt should also become more plentiful. In chromite, the U.S. deficiency is put at 99 per cent with requirements exceeding world supply. In columbium the U.S. is entirely dependent on other countries and world supply appears scarcer than that of any of the alloy metals. In antimony the deficiency is computed at 75 per cent though ample supplies are considered to exist. In asbestos the deficiency is 95 per cent and present supplies of all types are inadequate. For tungsten there is a 52 per cent deficiency, though somewhat surprisingly the supply is said to exceed the present demand. For quicksilver the U.S. is dependent on other countries to the extent of 90 per cent, though supplies are regarded as adequate. In the platinum metals the U.S. dependency is estimated at 90 per cent with supply and demand about in balance. For industrial diamonds the U.S. is entirely dependent on outside countries and though the future supply situation appears critical, a new electrolytic grinding method may be adopted. For bismuth the dependency is put between 50 and 55 per cent, though supply is regarded as adequate. For quartz crystals the U.S. is almost entirely dependent on Brazil though the supply is adequate and rapid strides have been made in the development of synthetic quartz crystals. The United States is 32 per cent deficient in ilmenite and about the same in rutile, but with the big developments in the production of titanium products the supply and demand is approximately in the balance. In selenium there is a dependency of 34 per cent, mainly on Canada. The U.S. is dependent for mica to the extent of 95 per cent on India, Brazil, Madagascar and Canada; high class mica is rather scarce. For beryl there is a 90 per cent dependency and the supply of beryllium is very tight. For fluorspar the U.S. requires about 35 per cent of its needs to be supplied by overseas countries, but the supply situation is not serious yet. Of course as and when stockpiling is judged to have reached the necessary level, which, of course must vary with each mineral, the position will be modified, but there can be little doubt that the mining world is promised the continuation of a very large and assured demand for its products for a long time to come.

Increasing Interest in British Guiana

There can be little doubt that the mineral possibilities of British Guiana, and indeed of all the British West Indies are receiving greater attention. This stems principally from the important part which bauxite mining is playing in the world's economy. In British Guiana, the Demerara Bauxite Company, a subsidiary of Alcan, and in Surinam, the Surinaamsche Bauxiet Maatschappij of Alcoa have for a considerable time been among the world's most important producers of the aluminium ore and more recently these two leaders in the aluminium industry have, with Reynolds, been responsible for great development in Jamaica also.

Activity being displayed in British Guiana is exemplified in the report of the Geological Survey for that colony, covering the year 1951, which has just reached us. In this report the director of the Survey, Dr. S. Bracewell, has compiled a lengthy report on the work of the Survey numbering eleven geologists during 1951. In this report it is stated that two new kilns, making eight in all, were to be installed last year by the Demerara Bauxite Co. at Mackenzie, increasing the drying capacity to 2,250,000 tons of bauxite annually. The Berbice Company now controlled by the Reynolds Metals Company, continued operations at Kwakwani on the Berbice river, barging the crude recovery to Everton for drying and export to the United States.

Gold production for the colony is again on the increase owing to the development of dredging. The output in 1951 was 14,688 oz., or nearly 1,000 oz. up on the year, and though we have not as yet got the figures for last year, these should reveal a further improvement. The new dredge of the British Guiana Consolidated Goldfields on the Potaro river was completed towards the end of 1951 and gold recoveries are reported to have been very satisfactory. The same company also has a dredge working on the Mahdia river, and concessions over the Konawaruk river as well as on the Potaro, with the assistance of a grant from the Colonial Development Corporation, are projected. At the annual meeting of the Company held last May the chairman stated that quotations for new dredges or, possibly second-hand dredges, were under consideration. The Barima Gold Mining Company, a Canadian venture, started dredging in the Barima river just above Arakaka in September 1951 with a single-bucket pontoon dredge, somewhat of the doodle-bug type. The Tikwah Mining Corporation starting cyaniding tailings from the old Peter's mine on the Puruni river towards the end of the year, and the Diamond Metals Corporation the hydraulicing of auriferous alluvial and eluvial deposits in the Mazaruni area. On the other hand the Cuyuni Goldfields remained idle during the year.

Diamond output also showed a small increase in 1951 with the production of 43,260 carats compared with 37,480 carats in the previous year. The Kurupung Placers Company with the aid of E.C.A. finance carried out detailed prospecting in the alluvial deposits adjoining that and the Anaborong rivers. This exploration work was still in hand during 1952 and results had not been published when Dr. Bracewell wrote his report. There was also considerable diamond mining activity in the neighbourhood of Kurashi Creek, a tributary of the Cuyuni where a rich deposit was located earlier in the year, but the main deposits had been almost worked out when the geologists' report was written. In the Potaro district above the Kaieteur Falls diving helmets enabled good results to be obtained and generally speaking there was increased activity in this branch of mining.

Further prospecting was carried out on the columbite deposits in the Morabesi area of the Mazaruni, together with some experimental work to determine the most efficient method of working. Speaking generally, samples of specific gravity of +5 appeared to contain sufficient columbite to warrant export. It was concluded that it would be necessary to treat the material by magnetic methods to separate the columbite from gahnite. A consignment of concentrate was shipped to the United States towards the end of the year.

Further examination of manganese deposits along the Barama and Barima rivers were made, and the M.A. Hanna Company of Cleveland, Ohio, made an examination of the Barima Gold Mining Company's area.

The report also mentions that the presence of cassiterite was established in a number of rock specimens from British Honduras.

An Industrial Shadow

Passage of the Steel Bill being no longer in doubt, preparations for the resale of the plants to prospective buyers are well in hand. It is now manifest that these transactions will take place in a sellers' market. Most of the big steel combines have published the financial results of the past year's working and in every case the profit-earning capacity of the industry is shown to be profoundly impressive. Two typical instances may be cited. At £8,429,000 the gross profit of the Steel Company of Wales has been more than doubled, and the Richard Thomas and Baldwins combine surplus of £10,560,000 is £1,698,000 better than in the previous year.

Quite clearly the phenomenal expansion of production which has already been achieved is not the only benefit of the post-war investment of £300,000,000 in the modernization and re-equipment of the industry. The operation of new plant has made possible such substantial economies in the cost of production that British steel prices have remained at a stable level over a long period, and are now well below world levels. Cheap British steel has become one of our best sellers abroad and is an economic boon to all the big metal using industries at home.

Resistance to inflationary pressures has hitherto paid good dividends, and still remains the fixed policy of the Minister of Supply who has the last word on this subject. The rise of 5 per cent in rail freight charges which was imposed on December 1 was readily absorbed by the steel industry although this charge also involved small additions to the delivered price of scrap. The prospect of a further advance in coal prices however is a horse of another colour. Since the National Coal Board was already working at a loss, the shilling a shift advance conceded to the miners, adding as it does £6,000,000 to the annual wage bill, must inevitably involve yet another increase in the cost of coal. Precise information concerning the amount of the rise is anxiously awaited by householders and industrialists alike — and none will be more seriously concerned than the makers of iron and steel who are the principal users. It is the one shadow on the horizon.

The Need for Native Mineworkers in South Africa

It will be recalled that in the June, 1952, issue of *Optima*, a quarterly magazine published by the Anglo American Corporation, an article dealing with the growing reservoir of native labour for the South African gold mines adopted the view that the fear of insufficient labour became less real when proper account was taken of the huge indigenous population of Central and Southern Africa.

Be that as it may, a less optimistic note has been struck by Mr. Harry Oppenheimer, who said in Cape Town earlier this week that an additional 80,000 native labourers would be needed if the new gold mines being developed in the Union were to be brought to full production. Mr. Oppenheimer regarded the position as "extremely serious," as existing mines were operating with only 77½ per cent of native labour requirements. The industry was attempting to meet the threat by importing more labour from outside the Union and by increased mechanization.

Australia

(From Our Own Correspondent)

Melbourne, January 30.

Production of fine gold in Western Australia, in the year ended December 31, 1952, reached the highest level in ten years. The total reported was 720,366 f.oz., which compares with 622,190 f.oz. in 1951, and 606,172 f.oz. in 1950. The result is very satisfactory, though some 300,000 oz. less than pre-war figures. An adverse factor is that the general high costs have forced the elimination of substantial tonnages of ore from reserves, and have necessitated the mining of higher grade ore to maintain the necessary margin of profit. The commencement of treatment by Great Western Consolidated should help to a still higher total production in 1953. A favourable factor is that there has been comparatively little alteration in the basic wage to apply in the first quarter of the year, this being the first halt in the steep rise since the commencement of the spiral several years ago.

The mine of Central Norseman Gold Corporation, in Western Australia, is maintaining a leading position amongst Australian gold mines. For the past year high values have been met in several parts of the mine and development work throughout the year has established the persistence of these good values, which have also influenced the mill recoveries. There is, therefore, reason to expect good returns for some time to come. In the Regent shaft section—that is the new deep shaft in the northern end of the property—progress of 50 ft. in a rise at No. 25 level has averaged 21.2 dwt. per ton over a width of 61 in. In the Royal shaft area of the Princess Royal, the south drive at the No. 5 level has shown values averaging 26.3 dwt. over 53 in. for a length of 74 ft., and on the same level, rising has disclosed ore averaging 22 dwt. over 48 in. to a height above rails of 50 ft. Winzing below this level has shown 50 dwt. over 48 in. for a depth of 21 ft., and in a second winze, 48 dwt. over a width of 48 in. for 10 ft. At the No. 6 level of the Royal shaft, the south drive has been advanced 62 ft. to 562 ft., the average grade being 21.2 dwt. over a width of 48 in. For the operating year to October 7, 1952—28 weeks—the average recovery was 10.37 dwt. gold per ton, while for the months of November and December, the average mill recovery has been 9 dwt. per ton.

QUEENSLAND

The new copper treatment section at Mount Isa Mines Ltd., North Queensland, is reported to be in operation. The construction of the concentrating plant and the smelter has been delayed by labour troubles, and the delivery of materials, particularly steel. Completion of the work is about six months behind schedule. Cost of the work approximates £A3,000,000. The copper orebody, which is parallel to the Black Star, the large silver-lead-zinc lode, contains reserves of 3,000,000 tons with an average assay value of 4 per cent copper. During the war, the company suspended the mining and treatment of lead-zinc ore to develop the copper lode and produce copper, which was urgently needed. The existing lead concentrating plant and smelter was used for the purpose until 1945, when the decision was made to proceed with the special section of each plant for the working of the copper orebody. The lead-zinc, and the copper sections of the property will now have independent milling and smelting plants. The company is applying to the Industrial Court for a variation of the lead bonus. The claim is for a reduction of the bonus from 6d. to 5d. per shift for every £1 the overseas price exceeds the starting price. The starting price is now £57 per ton, which the company desired changed to £81. A further request is that the starting price be adjusted quarterly, and that employees on holiday should receive half instead of the full bonus.

An American company, Titanium Alloy Manufacturing Co. Pty. Ltd., a subsidiary of the National Lead Co., of New York, has obtained an Authority to Prospect over 575 sq. miles, at Cloncurry, Queensland. The company proposes to carry out geological work, followed by diamond drilling in the search for lead, silver, zinc and copper. The term is for a period of six months with the right of renewal for a further term of 12 months. The enterprise is of interest, for Broken Hill South has already carried out extensive exploration in the Cloncurry district. At the beginning of this century, the district was one of the most important copper areas in Queensland. Four large companies are engaged in exploration in the north of the State. Mount Isa Mines has discovered considerable tonnages of silver-lead-zinc ore north of the mine ; Alluvial Prospectors Ltd. have completed 21,350 ft. of diamond drilling in the Mount Garnet district ; Mount Morgan Ltd. has proved an extensive zone of payable ore on the Sugarloaf area, adjoining the main mine ; and Titanium and Zirconium Industries Ltd. have proved 39,555,000 cu. yd. of mineral sands estimated to contain 1,192,00 tons of heavy mineral concentrate.

TIN IN NORTHERN TERRITORY

Centralia Minerals Ltd. is developing a large tin lode on the Maranboy Tinfield ; depth reached is 100 ft. and a lode, 10 ft. wide, has been driven on for 120 ft., values being stated as 4 per cent Sn. The Maranboy field is 280 miles south of Darwin ; it is extensive, and has been worked by parties, assisted by a Government battery, for many years, the advent of company interest being recent. Several months ago, the Broken Hill Proprietary Co. took options over seven leases. It is now reported that the leases have been relinquished. A report by the Commonwealth Bureau of Mineral Resources gives the length of the main lode as three miles, with a width up to 24 ft., the area of the field being stated as 3 sq. miles.

SOUTH AUSTRALIAN URANIUM

It is reported that productive operations at the Radium Hill mine have been proceeding since October, 1952. Concentrate from the milling plant at the mine is consigned by rail to the extraction plant and refinery at Adelaide. Available information suggests that the ore occurrence is large and low grade, and that there are exploratory possibilities in the surrounding country, which are being investigated by the South Australian Government which is carrying out the development and operational work. Underground development and opening up have been in progress for some time, and an active diamond drilling programme has been part of the policy. A difficulty at the new enterprise is the provision of an adequate water supply for mine and, particularly, domestic purposes, the district being arid, the rainfall light, and evaporation high.

GOLD MINING IN FIJI

Emperor Gold Mining Co., Loloma (Fiji) Gold Mines, and Dolphin Gold Mines, the three operating companies in Fiji, have taken up leases aggregating 14,000 acres on the north and east of the Emperor Mine property. This new area will be prospected by the three companies jointly, the objective being to provide continuity of gold mining when the operations in the mines now working, have contracted. An inducement to the new enterprise has been the attitude to the industry of the Fijian Government in granting royalty and tax concessions to the companies which look forward also to a higher price for gold on the world's markets. It is stated that the companies have the men, plant and organization to carry out the exploratory policy, and that the prospects of discovering payable ore occurrences on the new field are favourable.

The Problem of Silver

The following article attempts to give a general picture of the international silver situation in 1952. It is largely based on the annual circulars published by bullion firms in this country, together with the annual review of the silver market published by Messrs. Handy & Harman. The conclusion reached is that 1953 might see some stirrings in the silver market and an upward trend in its price.

Silver, for those whose task it is to watch over its narrow fluctuating course from one year to the next, has come to be regarded in the same way as any other commodity—its movements being explained by reference to changes in the supply and demand situation.

SILVER'S ROLE AS A MONETARY METAL

Indeed, it has been all too common a practice when discussing the silver situation to begin with the major premise that silver has little or no importance as a monetary metal. Consequently, it is not subject to international monetary factors; rarely used as a medium of exchange; no longer hoarded as a store of wealth; and, in a great number of countries it is not used as one of the metals comprising their " silver " coinage. Yet a careful reading of the annual circulars published by bullion firms in this country, together with Messrs. Handy and Harman's *Annual Review of the Silver Market, 1952,* reveals that if the role of silver as a monetary metal is not what it was at one time it was precisely the shadow of its former monetary strength which enabled the metal to show a bright but hard glint to metal market prices in 1952. Out of a partial estimated world production of 172,000,000 oz., demand for silver for coinage purposes was estimated at approximately 104,000,000 oz. or roughly 60 per cent of the total production. Put another way, as the world's silver production and consumption table presented elsewhere on this page clearly shows, employment of silver for coinage purposes constituted about 45 per cent of the total consumption in 1952. In fact, the amount consumed by the U.S. Mint of 57,300,000 oz. of silver during the year in the production of domestic coins represented an increase of nearly 13,000,000 oz. over the total used in 1951, and was the largest amount consumed by the U.S. Government for coinage since 1945.

Pursuing this line of thought, Handy and Harman's report states that of the 41,000,000 oz. acquired by the Bank of Mexico during the year about 5,000,000 oz. were obtained from the country's old .720 fine one-peso coins, which continued to come out of hoarding. Dishoarding also played its part in India where, because of the official ban on silver imports and exports, consumers were limited to supplies coming on the market from this source.

One other important point in the international monetary situation in which silver participated was its use in commodity shunting transactions. These transactions affected this country until about March of last year when the British authorities insisted that silver could in future only be exported to the Continent if the buyer undertook not to re-ship it to the western hemisphere. This step reduced the hitherto effective demand from the Continent and the premium over the official quotation that buyers for export had been willing to pay fell sharply from 9d. and soon ran off altogether. But, as Messrs. Mocatta and Goldsmid in their annual circular point out, it was the recovery in transferable sterling which effectually brought to an end the demand for silver in these commodity shunting transactions.

While there is no denying the rough justice of the statement that silver no longer plays a large part in the international monetary markets, its present position in this field is still sufficiently important for it not to be dismissed as of no account.

During 1952 the price of silver was confined to narrow fluctuations, there being in all only six changes in the published price. The official London price during the year was, in general, based on an approximate conversion of the New York quotation plus an adjustment for theoretical shipping charges from New York. Accordingly, the opening rate of 77d. (88 c.) was also the high for the year while the low of 72½d. (82¾ c.) was reached on May 29 just one day after the New York price reached this level.

SILVER PRODUCTION

(In millions of ounces)

	1952 (Est.)	1951	1950
United States	40.5	40.0	42.1
Mexico	45.0	43.8	49.1
Canada	25.0	24.2	23.2
Peru	17.0	14.9	13.4
Bolivia	6.0	7.2	6.6
Other South and Central American Countries	7.5	6.8	6.9
Total Western Hemisphere	141.0	136.9	141.3
Outside the Western Hemisphere (Partial)	31.0	30.0	26.0
World Production (Partial)	172.0	166.9	167.3

SILVER CONSUMPTION (Partial)

(In millions of ounces)

	1952	1951	1950
Arts and Industries			
United States	95.0	110.0	120.0
Germany	11.3	11.5	9.6
Great Britain	11.0	16.5	12.2
Canada	4.2	4.6	5.2
Japan	3.5	3.5	(*)
Mexico	2.2	2.0	2.5
Total	127.2	148.1	149.5
Coinage			
United States	57.3	44.4	24.6
Saudi-Arabia	23.0	21.0	—
Germany	8.8	9.9	—
Mexico	8.3	4.5	3.8
Canada	4.2	3.8	3.8
Other Countries	2.5	.4	1.5
Total	104.1	84.0	33.7
Total Consumption	231.3	232.1	183.2

(*) Not available.

Handy and Harman estimated that consumption for essential uses in the U.K. dropped to about 9,000,000 oz. in 1952 compared with 13,800,000 oz. in 1951. One explanation as to why the official market in this country was a good deal quieter is given by Mocatta and Goldsmid who state that this was partly due to the largely increased use of scrap silver in essential industry. In the United States, as aforementioned, demand for silver for coinage purposes was the highest since 1945, and Handy and Harman write that free stocks of Treasury silver declined by some 39,000,000 oz. in the first 11 months of the year. Preliminary end-year figures, however, will probably show that a further downward adjustment of approximately 6,000,000 oz. will have to be made owing to heavy coinage requirements during the last month of the year.

The arts and industries in the United States consumed 95,000,000 oz. in 1952 compared with 110,000,000 oz. in 1951, a reduction of 13.6 per cent. Silverware, both sterling and plated, accounted for less than one half the total whereas the proportion five years ago was about two-thirds. The decline in this ratio over the years arises from the steady expansion in the use of silver for industrial products both for defence and civilian purposes. In addition to the continued expansion in the applications of silver brazing alloys, there are other industrial uses of silver which are growing in importance notably in the chemical, electric and the electronic fields. The scope and extent of the demand for silver for the implementation of plans laid by the dif-

ferent Atomic Energy Commissions in the Western world appear to be considerable, though an unknown quantity, and neither Handy and Harman's annual review nor the bullion circulars already published in this country make mention of the demand for this purpose.

Turning to the production of silver, the table accompanying this article demands little elaboration, save that the figure given for production outside the western hemisphere includes that of Australia which Handy and Harman estimate at approximately 11,000,000 oz. compared with 10,500,000 oz. in 1951. Japan's production, which has been improving since the war, is estimated at 7,500,000 oz.

LEND-LEASE SILVER REPAYMENTS

Unfortunately, no comment is offered on the "lend-lease" silver repayments which stand as the most crucial factor likely to affect the international silver market in the years ahead. The total amount of "lend-lease" silver outstanding at December 31, 1952, is shown in the following table.

Country	*(in millions of ounces)*
India and Pakistan	226.0
United Kingdom	88.1
The Netherlands	56.7
Saudi-Arabia	22.3
Australia	11.8
Ethiopia	5.4
Fiji Islands	.2
Total	410.5

There has been no change in this total figure since 1947. But the ratification of the Japanese Peace Treaty in April last year established the beginning of the five-year period by the end of which such silver is to be returned to the United States Treasury. The difficulties which would be involved if the U.S. Government insisted on the return of such a vast quantity of silver needs no amplification. Thus the unknown attitude of the new American Administration introduces an incalculable element into the future of the world silver market. Although the U.K.'s own liability is confined to 88,000,000 oz., Mocatta and Goldsmid state that the British Government also guaranteed the repayment by the Indian Government of some 226,000,000 oz. (Under the partition agreement the total lend-lease liability of this amount is being shared by both India and Pakistan, under an agreed formula, with India assuming the major portion.) The U.K.'s own liability could perhaps be ultimately provided out of demonetized stocks, although it is understood that no silver was recovered from this source during 1952. India has announced her intention to return her full obligation under lend-lease, the silver to be obtained by melting the quaternary coins demonetized several years ago which, according to Handy and Harman, are estimated to contain about 300,000,000 oz. This latter statement does not sit easily with the view expressed by Mocatta and Goldsmid in their annual circular wherein it is stated that "it is not thought that Indian Government stocks contain anything approaching this figure." In any event, the decision which must be taken on this matter, sooner or later, will be of great interest to those involved in the world's silver market.

Referring to prospects for 1953 Handy and Harman state that there have been no changes during the year in the basic factors affecting the price of silver; that the nearby outlook is dependent on the decisions made in Mexico and Washington; and, a continuation of the policies followed in 1952 can be expected to provide the same stability which has characterized the year just ended. Broadly speaking, the validity of this statement rests on the twin supports of the Bank of Mexico continuing its policy of purchasing the major portion of their own production and the United States Treasury securing its own domestically produced silver by continuing to offer a price higher than the New York published quotation. By way of contrast to this forecast of Handy and Harman's that the silver market can depend on another year of inactivity, Mocatta and Goldsmid believe that the future of silver is uncertain. This view rests on the facts that industrial consumption in England and on the Continent has fallen; that with the exception of a further order from Saudi Arabia, the amounts of new silver used in coinage have been negligible and that Japan has begun to liquidate its stocks of silver which they estimate at about 10,000,000 oz. (Japanese silver stocks were estimated at between 50-60,000,000 oz. in 1951 by Handy and Harman but no mention is made of these stocks in their 1952 Annual Review.) Since the market for foreign silver in New York, they add, is freely supplied by Mexico and by Cuban demonetized silver it would appear that the tendency is likely to be downwards.

SILVER PRICE MAY GO HIGHER

Lack of regularly published authoritative information on silver reduces any estimate of the position to a hazardous guess. But since the Bank of Mexico's silver stocks decreased in 1952, according to Handy and Harman, to the low year-end figure of approximately 30,000,000 oz., and since the free silver bullion held in the U.S. Treasury has been reduced to around 79,000,000 oz. compared with over 171,000,000 oz. in 1949, it would appear that there is not the same room for manoeuvre by either Mexico or the United States to pursue policies as flexible as those of preceding years. With regard to Japanese silver stocks, Handy and Harman report the liquidation of 6,000,000 oz. during the year and consumption by Japan of 3,500,000 oz. With an estimated production of 7,500,000 oz. in the current year and estimated consumption of about half of this figure, the remaining Japanese stocks should be easily absorbed.

Industrial consumption in Western Germany, one of the largest Continental consumers, held up well during 1952 and there are no signs apparent, so far, that consumption will show a considerable reduction this year. Demand for silver in this country—especially for silverware, both sterling and plated—could undergo a marked change by any appreciable reduction in the purchase tax in the forthcoming budget.

But how far and to what extent there may be a revival in the demand for silver for coinage purposes is impossible to estimate. A solution to this question lies partly in the realms of psychology—the attitude which individual nations have towards the continued usage of a debased coinage—and partly to the availability and cost of substitute metals. This particularly applies to countries desirous of using copper and nickel as the main metals for the production of new coinage. The fact that the British Government's policy of demonetizing its silver coinage in favour of cupro-nickel coins was at a standstill last year, has been due to the high cost and non-availability of these metals for this purpose.

Thus there does not appear to be a convincing case that, on balance, the price of silver during the current year will trend downwards. On the contrary, Mexican silver production shows signs of going into a further decline; the reserves held by the Bank of Mexico are unusually low; the U.S. Treasury may be glad to build up its reserves of silver; Cuban stocks held in the U.S. were not offered on the market last year and as that country is gradually reducing its stocks for its own coinage purposes there seems to be no good reason why they should be dumped on the market during 1953. Moreover, the statistical positions for copper, aluminium and nickel, the chief substitute metals for coinage purposes, if a little easier, show no signs of reflecting this condition in their price. There is too, the possibility that the depressed price for lead and zinc, with which metals silver is very often associated, will cause a good number of mines to close thereby restricting the supply of new silver coming on to the markets.

While it is too early in the year to see how many, if any, of these factors will actually affect the buying policies of Governments, there appears to be a fairly strong case for the belief that this year might see some stirrings in the silver market and an upward trend in price.

A Preliminary Description of the Nigerian Lead-Zinc Field

By J. L. FARRINGTON

The following article, abstracted from a paper published in *Economic Geology*, presents a preliminary description of the Nigerian lead-zinc field based on the results of explorations carried out by Amalgamated Tin Mines of Nigeria under the author's direction. Particular interest attaches to this article because of the recent investigations into the possibility of opening up sizeable lead-zinc mines in this area under the aegis of American Smelting & Refining Company.

In the past five years renewed interest has been taken in the Nigerian lead-zinc field, due to the demand for these metals and the enhanced prices they now command. The earliest recorded modern working of these deposits appears to have been in 1885, although local inhabitants worked the outcrop sections of many deposits long before that and it is possible that the early Portuguese traders took a hand in mining the southern region. Zurak, Arufu, and the Abakaliki district were the main localities known at the time of the initial mineral surveys of Nigeria between the years 1904-1909. Production was first recorded in 1925 and continued on a small scale to 1937 when it ceased owing to the very low price of lead. Production recommenced on a very small scale in 1947. At present there are not any milling plants operating but exploration and development are in progress in a number of localities.

This lead-zinc field extends some 350 miles in a narrow inland belt that is poorly served with communications and a comprehensive description of the field has not yet been published.

One oil company and a number of mining companies have been operating in different parts of the field for varying periods. Until recently all this work was of an exploratory nature; more specific investigations are now in progress in selected localities. A large fund of information has accrued from the activities of these companies and the Geological Survey, but much work remains to be done before a well substantiated account of the field can be given. This paper presents a preliminary description, which will need modification and amendment as new knowledge is acquired. It is based on the results of exploration done by Amalgamated Tin Mines of Nigeria Ltd. under the author's direction and the published and unpublished work of the Geological Survey, with additional information from many sources. Descriptions of individual mineral deposits are omitted because none are adequately opened up as yet and no opinion is offered as to the potentialities of the field at this early stage in its development.

HISTORICAL SUMMARY

No record has been traced of the earliest activities in the field. There is a certain amount of semi-legendary tradition narrated by the natives, apart from which one can only draw deductions from the old excavations. Native mining before the advent of European traders was quite largely, if not mainly, for the purpose of obtaining iron. Slag is often found in the spoil near old workings and large slag heaps have been found in the Abakaliki district. Digging implements have been found in collapsed workings as much as 30 ft. below the surface.

From the time of the first native mining to the present, much interest has been shown by them in occurrences rich in iron and/or galena. Although the history and often the location of many occurrences have been forgotten, intensive work was done on the surface sections of practically all the iron and galena-rich outcrops. Iron was smelted from some of these outcrops until the advent of European trade brought easier supplies of the ready made metal. Cubical galena has long been prized as a cosmetic in Nigeria.

The first record of European mining dates from 1885 when, there was a mining camp at Arufu where a considerable pocket of silver was discovered and worked out. Mining companies started pegging ground at Zurak, Arufu, and in the Abakaliki district shortly before World War I but the first production was not recorded until 1925 when the Zurak Mine commenced shipping concentrates. This mine continued producing silver-rich lead concentrates until 1937 when the proportion of galena in the ore and the grade of silver fell below the then economic limit. During the life of this mine the price of lead was so low that only high silver ore was profitable. Arufu did not have any recorded production. A fair amount of prospecting was done in the Abakaliki district and some 660 tons of lead concentrates were produced from there between 1925 and 1929. In 1937 all operations were suspended owing to the low price of lead and the difficult communications. With the higher price of lead in 1947 renewed interest was taken in the field and exploration and development are now in progress. A small production has been recorded since 1947 but this does not come from properly organized mines; no milling plants are in operation at present.

There is practically no skilled labour available within the field except at Enugu. Artisans and clerks are available from other parts of Nigeria. Unskilled labour is available in moderately large numbers in most localities except during the planting season just before the rains. There are not any permanent white inhabitants. At Enugu there is quite a large white community; elsewhere there are a few dozen scattered on small stations, nearly all south of Makurdi.

THE GEOLOGY OF THE DEPOSITS

The Nigerian lead and zinc deposits, with a few minor exceptions, all occur in rocks of lower Cretaceous, or, at the latest, Turonian age. The exceptions are situated to the northwest in the crystalline rocks. Sediments of the upper Cretaceous are widely distributed in Nigeria west of longitude 7° 30′ E and as an overlap covering most if not all of the northwest flank of the lower Cretaceous in the Benue valley. Estimates of the thicknesses of these formations can only be approximate. Lees estimates a total thickness of 15,000 ft. for the Tertiary and the Cretaceous in southern Nigeria. Recent work in this region indicates that this figure may have to be increased.

There has been considerable intrusive activity, most of it small scale, in many parts of the lower Cretaceous of Nigeria. Volcanic activity on the other hand is known to have occurred until recent times. Intrusive rocks are widely distributed from Ishiagu almost as far as Zurak, a distance of 310 miles. Careful examination of almost any area, however, generally discloses some igneous rocks that either do not outcrop or are inconspicuously exposed. Doubtless many more occurrences remain to be found.

The lead-zinc deposits of this field, with one minor exception, are all fracture filling veins. The mineralized fractures form part of fractured or sheeted zones. Individual zones exhibit a fairly simple pattern of closely jointed ground in which one or more better developed fractures

may occur. The width of the zones varies from a few feet to 50 ft. or more averaging, perhaps 20 ft. in better developed cases. Few zones have been accurately delimited in strike beyond ore lenses, but several are known to exceed a mile in length.

ORE BEARING ZONES AND THEIR FORMATION

All the lodes are markedly lenticular in habit. In general, the veins are narrow (less than 8 ft.) but locally they may swell to appreciably greater widths; lenses are characterized by pinches and swells. Beyond the ends of lenses, the veins consist of one or more thin stringers of gangue with few sulphides. The outcrops of these veins have been extensively excavated in the past and undisturbed outcrops are rare. This is particularly true of the siderite-rich veins and the author does not know of a single completely undisturbed outcrop of any size of this type.

The character of the wall rocks appears to have an important bearing on the size and nature of the veins. Tattam considers that the type of country rock is a major factor in determining the strength of mineralization. Certainly all the more promising deposits occur in the finer sediments.

The silver content of the galena ranges from one to ten oz. per ton of crude galena over most of the field. High silver values, although not rare, appear to be confined to certain lodes or ore-shoots. Galena concentrates shipped from the Zurak Mine from 1935 to 1937 consistently averaged 12 oz. of silver per ton. Higher silver assays have been recorded but they are from isolated samples and would not appear to be representative even of small ore bodies, except at Arufu where native silver occurs. Marcasite is associated with many of the quartz bodies and may be locally abundant. Generally, however, it is sparsely distributed.

The mineralogy and other known characteristics of the more important veins in this field correspond well with those of other well known galena-sphalerite-siderite associations elsewhere. Tattam considers the best analogue to the Nigerian field to be the Rhenish Schiefergebirge. Here, and in other similar fields, the mineralization is generally regarded as being of magmatic hydrothermal origin and there are not any cogent reasons to believe that the mineralization in the Nigeria field differs in this respect. It may be inferred with some degree of assurance that mineralization took place an appreciable distance beneath the existing surface. The massive nature of the ore and gangue minerals, the dark opaque sphalerite, and the general characteristics of the mineral assemblage indicate formation at a medium temperature. The lead-zinc veins are extensively oxidized above the water table.

Zinc minerals are extremely rare in the well weathered portions of veins. Secondary copper minerals are occasionally seen. The transition from completely weathered to largely unweathered as the vein is followed downward is quite abrupt and may occur above the permanent water table.

The extent to which secondary action has re-distributed the lead and zinc in the upper portions of these veins is important at the present stage of investigation. While there is no doubt that a large proportion of any zinc originally present in the oxidized zone has been removed, the behaviour of the lead is open to question. Mackay believes that migration of the ore minerals accounted for the increase in the Zn:Pb ratio from surface to a depth of 280 ft. at Zurak. Since this was written, diamond drilling has indicated that the Zn:Pb ratio may also decrease with depth over a similar limited range. The author prefers to regard these changes from lead-zinc to zinc-rich ore as being entirely due to primary causes.

Cast Basalt Liners for Mining Plant

By A. G. THOMSON

The limited life of the brick and metal linings used in mines and quarries has given rise to the growing utilization of cast basalt tiles for the protection of mining plant. These tiles are manufactured by H. Windsor and Co. Ltd. and in the following article a description of their application is given, while at the same time their marked durability is indicated.

Mines and quarries handling large tonnages of coal, sand, gravel, felspar, quartz, metalliferous ores, ash and other abrasive materials are faced with difficult maintenance problems. To minimize the cost and inconvenience of frequent replacements, plant which is subjected to excessive wear is protected by lining it with some abrasion-resistant material, but under the worst conditions of abrasion and corrosion the most durable brick or metal linings have only a limited life.

Cast basalt tiles, cast in standard or special shapes, are being extensively used for the protection of mining plant by H. Windsor and Co. Ltd., who report a rapidly growing demand, and among large users in Great Britain are coal mines, Gas Boards, Electricity Authorities and the iron and steel Industry.

Cast basalt is produced by melting selected natural volcanic rock in a furnace at high temperature, and then casting in moulds. Carefuly controlled finishing processes give the material a resistance to abrasion and corrosion which is unsurpassed. Almost as hard as the diamond, it has a compressive strength of over 70,000 lb./sq. in., while its specific gravity is only 2.84. It is heat resistant up to 480° F. and in certain circumstances up to 740° F., but is susceptible to sudden changes of temperature. Concentrated acids have no effect on it, and it is impervious to strong alkalis and other aggressive liquids at all commercial concentrations and temperatures.

Experience has shown that under the worst conditions of abrasion and corrosion, cast basalt lasts many times as long as red or blue bricks, cast iron, or even the hardest chrome or manganese steel. A cast basalt tile, originally 1¼ in. thick, was removed from an ash race lining at a London power station after having been subjected to the abrasion of about 35 tons of ash daily for ten years. On examination it was found to have worn down by only a quarter of an inch, although 1 in. thick cast iron liners in the same ash race required renewal after a matter of months. On a coke wharf at the works of the Appleby-Frodingham Steel Company, cast basalt was still in use after 225 days, whereas red bricks lasted for only 161 days. On the same company's coke chutes, red bricks had a life of 42 days, but after 205 days cast basalt tiles were still in use.

A DURABLE PRODUCT

In general, comparative figures show that where wear is due solely to abrasion (i.e., a slipping movement over the surface) cast basalt lasts ten to twenty times as long as mild steel or chilled cast iron and compares even more favourably with brick. On the other hand, it does not stand up to pure impact as well as some other abrasion resistant materials. When wear is due to a combination of impact and abrasion the problem requires very thorough investigation and expert guidance should be sought. H. Windsor and Co. Ltd. are pleased to advise as to the suitability of cast

basalt for any particular application. Some interesting performance figures under conditions of combined impact and abrasion have been supplied by the Coke Oven Department of the Stanton Ironworks Company Ltd., who tried blue brick paviors and chilled cast iron 1in. thick before specifying cast basalt tiles for the linings of their coke chutes. The cast basalt tiles lasted approximately fourteen times as long as blue paviors and seven and a halt times as long as chilled cast iron. They had an average life of forty-five weeks and 202,000 tons of blast furnace coke have passed over the chute during that period.

Though the cost of lining with cast basalt tiles is roughly seven times that of a blue brick lining, the total cost over a long period is likely to be very much lower, and in addition, there is a considerable saving in labour costs and working hours lost while continual relining takes place. Obviously, it would not be economical to specify cast basalt for the protection of structures which require frequent replacement even when suitably lined.

SUPPLY AND INSTALLATION

At one time cast basalt liners could only be obtained in the form of square and rectangular tiles 8 in. by 8 in. and 8 in. by 4 in. respectively. Nowadays, coved, as well as flat rectangular or square liners, are available and circular liners are supplied in standard sizes for half- or third-round channels. Hexagonal, triangular or other special shapes can also be supplied from stock. The cutting of cast basalt is not recommended because the hardness of the material makes the operation laborious, and also because of the danger of leaving jagged edges which might make tight joints difficult. Though tiles of standard sizes are mass produced, most orders are, therefore, executed to users' special needs; a laying plan being supplied with complete linings on which the exact position of each tile is shown.

Since cast basalt has approximately the same weight as aluminium, its installation does not add considerably to the weight to be borne by the supporting structure, so that plants can be lined without any major alterations. All types of channels—whether iron, steel or concrete—can be protected, the depth of channel being immaterial since the walls can be lined with flat liners up to any height required. Hoppers and bunkers of any size and shape can be lined without difficulty; roofs between the outlets of bunkers, for example, can be fully covered by capping and angle tiles cast to shape and size. When used in chutes and sloping channels, cast basalt has the added advantage of giving a more favourable angle of slip than steel plate.

Dust particles travelling at high speed quickly wear through the cast iron or steel shells of cyclones or dust extractors, necessitating frequent renewals and increasing maintenance costs. Cast basalt is giving longer service than any other material so far used for protective linings in this type of plant. Another type of installation for which it has proved very suitable is drum mills. Conical, humped and flat liners for the drum and rectangular and flat liners for the headwalls are specially cast to suit users' requirements. The method of lining depends on the diameter of the drum.

Cast basalt tiles are easily laid by skilled bricklayers or tilers in cement mortars. If corrosion problems are presented by liquids which attack Portland cement, the difficulty can be overcome by using special acid resisting cements, spatulas or Ciment Fondu and granite. The joints should be as tight as possible and should be staggered in the direction of the material traversing the lining; otherwise, abrasion will take place along a continuous run of joints at a progressively increasing rate. The lining should be secured by angle irons or timber battens. When vertical surfaces are lined, strip irons should be fixed at intervals of one or two yards to support the weight of the lining. Care should be taken to ensure that the structure being protected is not liable to vibrate; if vibration is unavoidable the lining should be stiffened by means of angle irons. It is also important that any bending load should be taken up fully by the base, so that the cast basalt tiles are subject to abrasion only.

FACTORS OF APPLICATION

Cast basalt is also being extensively employed for protecting pipes or conduits used in hydraulic or pneumatic stowing plants in mines, or in handling dust, ash or pulverized fuel. Steel pipes subjected to abrasion and corrosion are lined with cast basalt cylinders and can readily be incorporated in any system by a simple adapted flange. The lining of pipes and conduits is carried out with special apparatus. The cast basalt cylinders are exactly centred and cement mortar is inserted under pressure between the pipe and the liner, thus ensuring a completely homogeneous filling and guaranteeing a secure and lasting bedding for the liner.

Normally the life of a conduit or pipe in a pneumatic or hydraulic system depends on a number of factors such as the type of piping, material conveyed, speed of flushing or blowing, quantity of flushing water used in proportion to the material conveyed, length and course of conduits, care taken in jointing the pipes, and maintenance of the system during use. Depending on these factors, the practical life of conduits varies from 296,000 to 2,960,000 cu. ft. throughput before abrasion renders the installation completely unserviceable. In view of the high cost of replacing steel liners, cast basalt lined pipes can be expected to offer considerable economies.

North Norway in 1952

(From A Correspondent)

Oslo, January 30.

The year past has been not unfavourable despite the decline in the prices of zinc and lead which are about 30 per cent or 40 per cent lower than a year ago. The pyrites industry has suffered somewhat more and sales have been difficult.

Dealing with individual properties in detail :

Sulitjelma mined 247,000 tonnes of ore which yielded 6,700 tonnes of iron pyrites concentrates, 2,800 tonnes of bessemer copper and 2,500 tonnes of zinc concentrates, the total being valued at Kr. 18,000,000.

Björkaasen Mine in Ballangen mined 132,000 tonnes of ore from which were obtained 70,000 tonnes of iron pyrites, 1,400 tonnes of copper concentrates and 530 tonnes of zinc concentrates valued at Kr. 4,300,000.

The Skaland Graphite workings yielded 4,100 tonnes of graphite concentrates valued at Kr. 2,350,000.

The Nord-Norge Mining Company at Mo-in-Rana reports 40,675 tonnes of ore won from the Mofjell Mine and 10,000 tonnes from the Bleikvassli Mine, which with concentrates from other properties yielded 4,584 tonnes of zinc concentrates, 589 tonnes of lead concentrates, 782 tonnes of copper concentrates and 5,728 tonnes of pyrites concentrates—all the products of flotation.

Nord-Norge Ltd. produced 382 tonnes of copper and 5,728 tonnes of pyrites concentrates; the power supply was affected by the dry and cold autumn. The Bleikvassli Mine extracted about 11,000 tonnes of raw ore which was treated at the Nord-Norge Mill.

The Altermark Talc Mine produced about 10,000 tonnes of raw talc valued at Kr. 395,000; a sister company, the Hammerfall Dolomite Quarry, produced about 90,000 tonnes of dolomite, most of which went to the Heröya Light Metal Factory. The Orkla Quartz Quarry in Sörfold improved its output to 30,000 tonnes.

MACHINERY AND EQUIPMENT

A New Fan Test Code

At the Holborn Restaurant on Tuesday of this week, the Fan Manufacturers' Association Ltd. introduced its new Fan Test Code 3:1952. Mr. M. Geoffrey Woods, hon. secretary treasurer, emphasized that the fan industry was a small but highly specialized one which played a vital part in modern industry.

The first standard code (B.S. 848) for the testing of fans was issued thirteen years ago and was based on the Institute of Heating and Ventilating Engineers Fan Standardization Committee's Report.

It was felt, however, that B.S. 848:1939 needed revision and accordingly after the Fan Manufacturers' Association was formed in 1944, a technical committee was appointed to prepare a Performance Test Code based on current knowledge and practice. The work involved in this project extended over some five and a half years and included a considerable amount of experimental work in the laboratories of members. There was no intention of departing entirely from B.S. 848:1939 and all unnecessary alterations were avoided, for the objective was to revise the code wherever it did not conform to modern practice.

As a result of these deliberations, the new Fan Manufacturers' Code retains much of the structure of the B.S. 848:1939, while presenting a more precise and comprehensive survey of test data, and new test methods have been introduced in place of those proposed in the original code. The code is well produced and is a model of clarity. Its matter and diagrams fill some 37 large pages and the price is 9s. 6d., or 10s. post free.

Electrical Equipment Exported to Spain

An export order valued at approximately £1,000,000 for the main electrical equipment for a big new iron and steel works in Spain has been placed with the English Electric Co. Ltd. The equipment includes a 7,000 h.p. twin drive for a 42 in. blooming mill; a set of Ward-Leonard drives for the blooming mill auxiliaries and for the bloom shear: two 6,700 h.p. motors for driving the three stands of a 32 in. section mill, and numerous other auxiliary items of equipment. The contracts have been placed by the Empresa Nacional Siderurgica, a company sponsored by the Spanish Government.

The new iron and steel works, which will raise Spanish steel production substantially, will be built near the estuary of the Aviles River in Asturias. The first stage will be in operation towards the end of 1956 or early in 1957, and the output will amount to 350,000 tons of steel a year, which is almost half as much again as Spain's present total production.

Other important equipment orders for this new steel works, which together with the English Electric contracts amount to £6,000,000, have also been placed with engineering firms in this country through the Metallurgical Equipment Export Co. Ltd., representing a group of British manufacturers formed for the purpose of co-ordinating the export activities of its members.

Of the English Electric equipments, the 42 in. blooming mill will be driven by a 7,000 h.p. (RMS) 50/120 r.p.m. unit, built as two motors in the twin-drive arrangement. In this layout, one motor drives over the top of the other via a jack shaft, and by these means the otherwise-necessary pinion housing and its losses and maintenance are eliminated. The main drive will have a single armature motor for the upper drive and an identical unit for the bottom drive. It will be complete with motor-generator flywheel set and control gear of the most modern type, giving automatic protection and maximum response rate.

Two stands of the 32 in. section mill will be driven by one 6,700 h.p. (RMS) 80/180 r.p.m. motor, and the third stand will be driven by an identical unit. These drives will be of the conventional type working through pinions, and again the motors will be complete with motor-generator flywheel sets and control gear. The bloom shear requires a 2-motor drive rated at 2,000 h.p. and the generators will be attached to the motor-generator set for the blooming mill main drive. There will also be control gear to give the rapid acceleration and deceleration needed to allow the shear mechanism to make only one cut at a time if so required.

The blooming mill will have Ward-Leonard Auxiliary drives for the screwdown, tables and manipulators, in line with modern practice. These drives will be fed from motor-generator sets and will be under the control of systems similar to, but simpler than, those for the main drive. There will be many sets of motors and control gear for standard duties such as pumps and fans and for many other purposes connected with the processing of the steel, such as straightening machines and roller levellers. Some of these drives will be D.C. and others A.C.

A New Boot for the Miner and Quarryman

The recent statement by Mr. Harold Watkinson, Parliamentary Secretary to the Ministry of Labour, that approximately 29,000 foot injuries occurred in British factories during 1952, has focused considerable attention on the various types of safety footwear at present available. Of interest besides the more emphasized weight resistance of toecaps is the general strength of a boot or shoe and its resistance to different intensities of wear and tear. For if a man's work is such that he needs steel protection to safeguard his feet against heavy weights or falling objects, it is also highly probable that he needs durable footwear. In these cases the footwear supplied should be capable of resistance to hard knocks, heat, moisture, and the corrosive action of oils, active chemicals and the like.

Units of the Plus Fifty range of footwear

A typical example is the case of the quarryman or miner, whose feet are continually in contact with rough hewn, jagged rock, as well as grits and water. Protection for the toe and instep area must, in this case, be reinforced by strong construction of the footwear in general.

The combination of safety and durability is claimed to have been achieved by Protective Footwear Service Ltd., who have designed and manufactured a range of safety footwear for industry named the Plus Fifty. The name springs from the manufacturers' claim that the footwear not only provides full foot protection but in addition enjoys a 50 per cent longer life than the average safety boot. The construction is based on research and practical test results.

In this type of footwear, the standard steel toecap is built into the construction of the footwear itself, with stout leather and composition blocking above and below. This factor ensures the positive location of the toecap throughout the life of the shoe and eliminates the possibility of any cutting action by the upper edge of the steel cap.

In construction of the outer sole, the hide is first subjected to a chemical process known as chroming, and afterwards is tanned in the normal way by prolonged soaking in vegetable extract. The result is a water-resistant leather which is strong and flexible. Tests carried out by the British Boot, Shoe and Allied Trades Research Association have proved that this double treated leather has an average of twice the resistance to oil and approximately four times the resistance to water of normal vegetable tanned leathers. Threads are rot and acid proof. The company offers an insurance policy giving cover in case of death or injury incurred whilst wearing this particular footwear.

METALS, MINERALS AND ALLOYS

COPPER.—The principal interest this week has centered on the copper market where the uncertainty as to the future of the American price is leading to suspension of business. Over last week-end scrap prices, including those of copper, were decontrolled in the United States and scrap copper advanced from 19 c. to 27½ c. per lb. It was generally expected that a similar announcement would follow the Wednesday meeting in Washington of the N.P.A. and the trade, but so far no outcome is reported and pending some authoritative announcement most refiners and smelters have withdrawn from the scrap market. It seems probable that difficulties are being experienced in regulating wage agreements based upon the controlled price and it is thought that the two price market may continue for a while. Anyway, the situation in the American copper trade is very confused with its inevitable reactions on prices elsewhere. Increasing quantities of foreign copper are said to be becoming available in the U.S. both from Canada and to a somewhat lesser extent, from Rhodesia. From Chile there are the usual reports that the administration may increase prices by 2 c. to 3 c. per lb.; the output for the current year is now forecast at something like 400,000 tonnes.

Meanwhile, the anticipated trouble in Northern Rhodesia over the colour bar is appearing. The European Mine Workers Union issued an ultimatum to the engineering contractors to accept the restrictive conditions at present existing between the companies and the Union, which objects also to the transfer of certain artisans from day to shift work. The disputes have been referred to arbitration.

The following are the American Copper Institute's figures of world refined copper production for January together with the stock position. In connection with the latter, refined stocks outside of the United States have now been decreasing steadily over the past few months and now stand at the lowest figure they have touched during the past five years. This presumably is a reflection of the doubts which have been widely held outside of the States for some time past regarding the continued firmness of the American import copper price:—

	Production			*Stocks*		
	Jan. 1953	*Dec.* 1952	*Jan.-Dec.* 1952	*Jan. 31* 1953	*Dec. 31* 1952	*Jan. 31* 1952
U.S.A.	108,010	113,965	1,189,112	59,836	58,858	60,836
Other Countries	93,667	100,374	1,196,422	120,629	130,103	150,518
World	201,677	214,339	2,385,534	180,465	188,961	211,354

President Eisenhower has signed the Copper Duties Suspension Bill extending the period of suspension to June 30, 1954.

Coal shortage continues to curtail production in Northern Rhodesia, with the four producers averaging only about eight days' supply. Half the smelter and about a third of the refinery at Nkana have been shut down but output from Roan Antelope and Nchanga is not at present affected.

The International Materials Conference is discontinuing international allocation of copper from last week-end, though the position will be reviewed in March. Further allocations of copper are considered unlikely.

The Mount Isa smelter started operations last week and is expected to produce 25 tons of copper daily, to be increased later.

LEAD.—There is little fresh to note in regard to lead. The removal of controls on scrap prices in the United States did not have the psychological effect which it was at one time hoped, and in this country consumers are disinclined to lay in stocks owing to the increased cost of financing.

Mr. Felix Wormser, of the St. Joseph Lead Company, has been protesting that owing to the Reciprocal Trade Agreements Act the effect of tariff protection on lead hardly existed. Imports into the U.S. had been record breaking and in his opinion buffer stocks, international commodities agreement and subsidies had all failed as stabilizing agencies. In particular he protested against the report that the President's Material Policy Commission advocated the elimination of tariffs on metals and minerals.

Production of lead in Morocco last year is reported from Paris at 115,000 s.tons as against 93,001 in 1951. The output from Metropolitan France was 52,338 tonnes (47,974 in 1951).

It is anticipated that forward sales by Australian producers next month will relieve the tight position existing in the U.K. where the Ministry of Materials has almost entirely disposed of its stock. Demand from consumers continued slow.

TIN.—After the sharp decline towards the end of last week attributed to smelter sales on a thin market, prices improved this week, but there is nothing outstanding to notice in the general situation. The International Tin Study Group computes the output last year from mines at 172,500 tons, and consumption at 128,000 tons, leaving production at 44,500 tons in excess of output.

In the U.S., the O.P.S. control was removed but uncertainty continues as to the continuance of sales by the R.F.C. at their regular price of 121¼ c. As long as this prospect remains, the United States price may remain pegged at the old level.

In connection with last week's report that Texas Smelter interests are anxious to obtain the smelting of Indonesian concentrates, it is interesting to learn that the Indonesian Ambassador in the U.S. and the Commercial Counsellor are expected to visit the Longhorn smelter at the end of the month.

Imports of concentrates to the Straits Smelters in January totalled 774 tons, of which Thailand contributed 567 tons, and Burma 165 tons.

ZINC.—The recent fall in zinc has failed to stimulate business and consumer demand remains poor. The U.S. price is still 11.50 c. spot East St. Louis and 10 c. for export. U.S. consumer buying is described as fair.

Production in Metropolitan France last year is reported at 79,882 tonnes (74,557 in 1951). Moroccan production is given as 51,000 (36,662 in 1951). Japanese production for the year ended next March is estimated at 71,000 tonnes. This is expected to increase to something like 83,000 tonnes in the next fiscal year.

ALUMINIUM.—The Aluminium Import Corporation has announced the conclusion of arrangements under which a further 22,000 tons of Canadian metal, ear-marked for Britain, will be switched to the U.S. in the second quarter of the year. This is in addition to the like quantity arranged for in the current quarter, making the total 44,000 tons in all, and indicating Canadian exports to the U.S. of some 165,000 tons for the whole of the current year.

U.K. PRIMARY METAL STATISTICS—DECEMBER

(long tons)

(*All figures in l. tons*)	*Refined Copper*			*Lead†*			*Slab zinc*			*Tin metal*		
	Dec. 1952	*Jan.-Dec.* 1952	*Jan.-Dec.* 1951	*Dec.* 1952	*Jan.-Dec.* 1952	*Jan.-Dec.* 1951	*Dec.* 1952	*Jan.-Dec.* 1952	*Jan.-Dec.* 1951	*Dec.* 1952	*Jan.-Dec.* 1952	*Jan.-Dec.* 1951
U.K. stocks beginning period §	90,667	87,251	72,960	88,514	77,167	61,687	152,129	39,659	36,256	3,693	8,004	4,504
Imports	15,678	212,145	225,715	13,717	146,811	174,663	17,171	229,181	121,990	69	2,885	10,912
Production	8,657	151,701	129,647	5,955	85,785	73,609	8,117	68,733	69,734	2,786*	29,521*	26,103*
Consumption	21,742	347,646	330,361	17,403	194,650	232,122	11,655	170,885	188,177	1,834	22,555	23,891
Exports and Re-exports	102	684	863	15,300	42,641	91	7	144	28	514	21,928	5,840
U.K. stocks end period§‡	91,548	91,548	87,251	75,510	75,510	77,167	166,050	166,050	39,659	4,225	4,225	8,004

(Source: British Bureau of Non-Ferrous Metal Statistics)

*Estimated by International Tin Study Group. †Includes imported virgin lead and English refined from domestic ore and secondary metal. §Including any Government stocks other than strategic reserves. ‡In addition U.K. stocks of blister copper at the end of December were 40,420 tons; of zinc concentrates were 58,388 tons; and of tin in ore were 2,364 tons.

With reference to the refusal of the Canadian Government to release Canadian hydro-electric power for the proposed plant at Skagway in Alaska, it is rumoured that Frobisher is planning to employ some, at any rate, of this power.

The Indian Government has authorized the expansion of the national producing capacity by 12,500 tons to a total of 17,500 tons. Production in 1951 was 3,850 tons against a consumption estimated at 14,000 tons. The Indian Aluminium Co. plans a 10,000 ton unit at Hirakud, in Orissa, to be later expanded to 20,000 tons. The same company is to increase its Alwaye plant capacity from 2,500 tons to 5,000 tons per annum by the end of the year. The Aluminium Corporation of India would enlarge Asansol plant to 2,500 tons. Indian reserves of bauxite are estimated at 250,000,000 tons. Consumption of bauxite in 1951 is computed around 19,000 tons with a small quantity exported.

The first shipment amounting to 10,000 tons of bauxite has been made by the Kaiser Bauxite Company, the Jamaican subsidiary of the Kaiser Aluminium and Chemical Corporation.

The French output in 1952 is reported from Paris to have amounted to 106,087 tonnes (91,103 in 1951). The Japanese output last year is given as 41,564 tonnes (36,906 in 1951).

Iron and Steel

The changes in the price structure affected by Order No. 169 issued last week by the Minister of Supply, prove to be more extensive than was implied in the original brief announcement. An advance of 6s. to 6s. 6d. per ton in the delivered price of common foundry pig iron represents a substantial addition to the working costs of the iron foundries and moreover it is imposed at a time when this branch of industry is finding it difficult to secure new business. Staffordshire low phosphorus iron is up 26s. 6d., Scotch foundry iron 2s. and in the case of cylinder and refined irons the advance varies from 2s. to 3s. 6d. per ton.

It may be recalled that when the last revision of prices took place in October last, authorized maximum prices of all grades of iron produced from imported ores were steeply advanced, with the express purpose of transferring to the blast furnace operators the true cost of the foreign ore which they consumed. Foundry pig iron being mainly produced from home ores was exempt from this advance and even after the adjustments now in force it is still by far the cheapest grade of iron on the market.

In the case of scrap, the authorized increases are carefully calculated to cover the extra cost of rail transport and as the rise in railway rates took place on December 1 last, scrap traders point out that they have had to carry this financial burden for over 11 weeks without any compensation whatever.

Nevertheless the scrap merchants have co-operated wholeheartedly in the "drive" to swell the deliveries of home bought scrap and it transpires that the tonnage so provided last year was about 470,000 tons more than in 1951. Stocks, moreover, are gradually increasing and as there has also been a substantial expansion of pig iron production, the steel makers envisage no difficulty in maintaining their present record-breaking outputs.

As yet there is no sign of any abatement of the pressure for prompt deliveries of steel. But some of the arrears have been overtaken and consumers look forward to easier conditions as the spring approaches. The demand for plates is overwhelming and substantial export bookings for both black and galvanized sheets have been arranged for the first half of the current year.

The London Metal Market

(From Our Metal Exchange Correspondent)

The world copper market is in a state of suspense owing to the U.S. Administration's action in removing ceiling prices for copper scrap without freeing the metal itself, and it is hoped that the situation will be clarified in the near future. When trying to assess the possible price level of copper after complete freedom in the U.S. it must be remembered that there are a number of wage agreements which would have to be renegotiated if the U.S. domestic price increased by too much, and taking this into account it is probable that two prices will continue to exist for some time to come. Supplies of blister copper are more plentiful, and some tonnages are being offered below the old price level without finding buyers. In the U.K. the off-take from the government is still very much below its intake, and this fact weighs in favour of the re-opening of Exchange dealings in copper after the middle of this year.

The tin market has been featureless, with turnovers at a minimum but with offerings in the East being easily absorbed. The Eastern price on Thursday morning was equivalent to £957 per ton c.i.f. Europe.

The turnover on the lead market has remained satisfactory, and prices have not fluctuated very much as there has been slightly more consumer demand both here and in the States. February metal continues to be offered, and the backwardation has not shown any tendency to increase.

General disinterest in the zinc market caused a further decline in prices, and the recovery which took place in the middle of the week was probably of a technical nature as consumer interest remained at a very low ebb and American advices continued to indicate a lower price level.

Closing prices and turnover for the week are given in the following table:—

	February 12		*February 19*	
	Buyers	*Sellers*	*Buyers*	*Sellers*
Tin				
Cash	£969	£971	£958	£959
Three months	£940	£942	£937	£938
Settlement	£970		£959	
Week's turnover	225 tons		325 tons	
Lead				
Current month	£94⅜	£94½	£92½	£93
Three months	£92⅜	£92½	£92	£92¼
Week's turnover	4,650 tons		4,125 tons	
Zinc				
Current month	£81¼	£81½	£81½	£82
Three months	£81½	£81¾	£82	£82¼
Week's turnover	5,375 tons		3,625 tons	

FEBRUARY 19 PRICES

COPPER

Electrolytic .. .. £285 0 0 d/d

TIN, LEAD AND ZINC

(See our London Metal Exchange report for Thursday's prices)

ANTIMONY

English (99%) delivered, 10 cwt. and over .. .. £225 per ton
Crude (70%) .. .. .. £210 per ton
Ore (60% basis) .. .. .. 20s. — 22s. nom. per unit, c.i.f.

NICKEL

99.5% (home trade) .. .. £483 per ton

OTHER METALS

Aluminium, £166 per ton
Bismuth (min. 5 cwt. lots) 17s. 6d. lb.
Cadmium (Empire), 14s. 4d. lb.
Chromium, 6s. 5d./7s. 6d. lb.
Cobalt, 20s. lb.
Gold, 248s. f.oz.
Iridium, £60 oz. nom.
Magnesium, 2s. 10½d. lb.
Manganese Metal (96%-98%) £280/£295
Osmiridium, £40 oz. nom.
Osmium, £65/£70 oz. nom.
Palladium, £7 15s./£8 10s. oz.
Platinum, £27/£33 5s.
Rhodium, £42 10s. oz.
Ruthenium, £25 oz.
Quicksilver, £70 10s./£71 ex-warehouse
Selenium, 30s./30s. 6d. nom. per lb.
Silver 74d. f.oz. spot and f'd.
Tellurium, 18s./19s. lb.

ORES, ALLOYS, ETC.

Bismuth .. .. 50% 8s. 6d. lb. c.i.f.
40% 7s. 6d. lb. c.i.f.

Chrome Ore—
Rhodesian Metallurgical (lumpy) £13 2s. per ton c.i.f.
" " (concentrates) £13 2s. per ton c.i.f.
" " Refractory £12 14s. per ton c.i.f.
Baluchistan Metallurgical .. £14 15s. 6d. per ton c.i.f.
Magnesite, ground calcined .. £26 - £27 d/d
Magnesite, Raw .. .. .. £10 - £11 d/d
Molybdenite (85% basis) .. .. 103s. 10½d. per unit c.i.f.
Wolfram (65%) .. .. .. 330s. c.i.f. U.K. buying
" " .. .. .. 352s. 6d. Selling
Scheelite .. .. 320s. c.i.f. U.K. buying
" .. .. 342s. 6d. Selling
Tungsten Metal Powder (for steel manufacture) .. .. 30s. 8d. nom. per lb. (home)
Ferro-tungsten .. .. .. 25/3-25/9 nom. per lb. (home)
Carbide, 4-cwt. lots .. .. £35 13s. 9d. d/d per ton
Ferro-manganese, home .. .. £48 12s. 11d. per ton
Manganese Ore U.K. (48% - 50%) .. .. .. 6s. 1d. per unit
Brass Wire .. .. 2s. 7½d. per lb. basis
Brass Tubes, solid drawn .. 2s. 2d. per lb. basis

THE MINING MARKETS

(By Our Stock Exchange Correspondent)

Stock markets had a very good week. Optimism prevailed and there were good hopes of expanding trade during the current year. The January E.P.U. figures record a further reduction of £9,200,000 in the United Kingdom's overdraft; 70 per cent of this is settled in gold.

Kaffirs were active. It was announced that the South African election will take place on April 15. Generally news of this sort depresses markets but in fact this had little or no effect. Among finance houses Consolidated Goldfields and W.R.I.T.S. were outstanding on investment buying. Both these concerns are, of course, closely interested in the Far West Rand. Johnnies were the star turn. Before uranium became an important factor in this market, several of this company's older mines were nearing the end of their lives. Now the position is radically altered. Randfontein have been shooting ahead and passed the 40s. mark. Other mines in which Johnnies are interested are strongly rumoured to be uranium producers also. The bout of buying spread to most of the leading mines although uranium stocks were very much to the fore.

In the O.F.S. the Freddies group encountered considerable profit-taking. Interest in the shares of the parent company, however, revived later. There has been considerable discussion concerning the importance of the Rainbow Reefs and rumours of the flotation of another mine in the Van den Heversrust area by Geoffries, with the possible co-operation of Middle Wits are current. Harmony shot ahead on hopes of rapid underground development in the neighbourhood of the ventilation shaft. High borehole values were obtained in this area. In late dealings on Wednesday profit-taking set in.

In the miscellaneous gold section, Cam and Motor sharply improved following the quarterly report. Zambesia Exploration fell on the reduction of 5 per cent in the distribution.

Coppers were rather patchy. There is a definite feeling that the boom conditions are now a thing of the past, although the metal price still remains steady. There is fresh talk of reopening the free market and the de-restricting of many commodities in the U.S.A. may well help towards this end. A shortage of coal is again reported from the Northern Rhodesian belt and the output of copper is being curtailed. Half the smelters works and a considerable portion of the refineries at Nkana have been closed. Production at Roan Antelope and Nchanga is not affected. It is understood that the mines have about eight days' supply of coal in hand. Selection Trust improved. It is now eight months since they asked permission from the Treasury to emigrate. No reply has yet been received. In some quarters it is thought that this delay may be a hopeful sign and that permission may eventually be granted when conditions have somewhat altered. Messina have acquired an interest in an industrial company, the Aycliffe Cables (South Africa) Ltd. This will presumably be a useful customer for the internal consumption of copper during the years to come.

The British South Africa Company has granted Rio Tintos exclusive prospecting rights over two large areas in Northern Rhodesia. The areas are understood to be south and south-east of the existing copper-belt. Rio Tinto were unchanged following the news.

Among Nigerian tin producers, there was considerable interest in Amalgamated Tin. It is thought that this company, like Jantar, will shortly receive the bonus payment from the U.S.A. for columbite production. Other companies also interested to a lesser degree are Naraguta, Bisichi, and Gold and Base Metals. The price of tin has again fallen away.

Lead/zinc issues were generally easier on the gradual decline on the metal prices. Mount Isa, however, went ahead on the news that the copper plant has started production on a basis of 25 tons of copper daily. This is to be stepped up to between 40/50 tons daily. San Francisco Mines were also a good feature on optimistic expectations concerning the coming dividend.

FINANCE	Price Feb. 18	+ or — on week
African & European	2 15/32	+ 3/32
Anglo American Corpn.	6½	+ 3/8
Anglo-French	19/9	+ 3d
Anglo Transvaal Consol.	28/9	+ 2/6
Central Mining (£1 shrs.)	35/-	+ 1/10½
Consolidated Goldfields	52/3	+ 3/3
Consol. Mines Selection	29/4½	+ 1/10½
East Rand Consols	3/9	+ 4½d
General Mining	4 7/8	+ 7/16
H.E. Prop.	34/4½	+ 7½d
Henderson's Transvaal	9/6	+ 1/-
Johnnies	65/-	+ 5/-
Rand Mines	4½	+ ¼
Rand Selection	37/6	+ 1/3
Strathmore Consol.	35/-	+ 1/-
Union Corp. (2/6 units)	32/3	+ 3d
Vereeniging Estates	3 13/16	— 1/16
Writs	34/-	+ 2/1½
West Wits	46/3	
RAND GOLD		
Blyvoors	44/9	+ 1/6
Brakpan	15/3	+ 3d
City Deep	30/7½	+ 1/3
Consol. Main Reef	34/4½	+ 3/1½
Crown	40/7½	+ 7½d
Daggas	3¼	+ 1/32
Doornfontein	27/3	
Durban Deep	2 11/16	— 1/32
E. Daggas	22/-	+ 2/-
E. Geduld .. (4/- units)	40/-	+ 1/3
E. Rand Props	3 5/16	— 1/32
Geduld	5 5/16	+ ¼
Govt. Areas	15/3	+ 3d
Grootvlei	27/6	+ 3d
Libanon	11/4½	+ 7½d
Luipaards Vlei	27/9	+ 2/-
Marievale	22/9	+ 9d
Modderfontein East	20/-	
New Kleinfontein	26/3	+ 1/3
New Pioneer	15/-	+ 1/-
Randfontein	40/6	+ 7/6
Robinson Deep	12/-	+ 9d
Rose Deep	20/7½	— 7½d
Simmer & Jack	6/-	
S.A. Lands	31/10½	+ 7½d
Springs	7/3	+ 6d
Stilfontein	27/3	+ 1/1½
Sub Nigel	55/7½	+ 3/9
Van Dyk	9/-	
Venterspost	17/3	+ 9d
Vlakfontein	18/6	+ 2/-
Vogelstruisbult	34/6	+ 2/9
West Driefontein	6 13/16	+ ¼
W. Rand Consolidated	60/-	+ 1/10½
Western Reefs	47/6	+ 1/3
O.F.S.		
Freddies	14/1½	+ 1/1½
Freddies N.	14/7½	— 6d
Freddies S.	14/-	— 9d
F. S. Geduld	2 13/32	+ 1/32
Geoffries	18/-	+ 2/3
Harmony	23/6	+ 2/6
Loraine	10/-	+ 10½d
Lydenburg Estates	11/9	+ 1/9
Merriespruit	6/6	+ 6d
Middle Wits	17/1½	+ 1/7½
Ofsits	45/-	+ 6/3
President Brand	23/-	+ 3/6
President Steyn	21/1½	+ 1/7½
St. Helena	16/-	+ 1/4½
U.F.S.C. & G.	9/4½	+ 10½d
Virginia Ord.	14/-	+ 9d
Welkom	23/6	+ 3/-
Western Holdings	3 31/32	+ 1/32
WEST AFRICAN GOLD		
Amalgamated Banket	2/-	+ 1½d
Ariston	6/7½	— 1½d
Ashanti	25/-	+ 9d
Bibiani	7/1½	+ 6d
Bremang	2/6	+ 1½d
G.C. Main Reef	3/9	— 1½d
G.C. Selection Trust	7/-	+ 1½d
Konongo	2/10½	
Lyndhurst Deep	1/3	
Marlu	1/3	
Taquah & Abosso	4/-	
AUSTRALIAN GOLD		
Boulder Perseverance	2/3	
Gold Mines of Kalgoorlie	11/9	
Great Boulder Prop.	7/3	
Lake View and Star	17/6	+ 9d
Mount Morgan	19/- XD	— 6d
North Kalgurli	12/9	+ 3d
Sons of Gwalia	7/6	— 3d
South Kalgurli	8/1½	+ 7½d
Western Mining	11/9	— 1½d
MISCELLANEOUS GOLD		
Cam and Motor	9/9	+ 6d
Champion Reef	5/7½	— 3d
Falcon Mines	8/-	— 3d
Globe & Phoenix	25/9	
G.F. Rhodesian	6/7½	+ 4½d
London & Rhodesian	4/9	— 1½d
Motapa	1/7½	— 1½d
Mysore	3/-	
Nundydroog	6/-	
Ooregum	3/4½	
Oroville	11/6	
MISCELLANEOUS GOLD (contd.)		
St. John d'El Rey	27/6	— 6d
Zams	32/6	— 1/10½
DIAMONDS & PLATINUM		
Anglo American Inv.	4 13/32 XD	
Casts	25/3	— 3d
Cons. Diam. of S.W.A.	4½	
De Beers Defd. Bearer	71/3	— 3d
De Beers Pfd. Bearer	14½	— ½
Pots Platinum	10/-	
Watervaal	16/9	
COPPER		
Chartered	59/-	— 9d
Esperanza	4/3	— 7½d
Indian Copper	4/6	— 1½d
Messina	3 31/32	— ¼
Nchanga	6 13/32	+ 11/32
Rhod. Anglo-American	53/9	+ 1/9
Rhod. Katanga	12/-	+ 6d
Rhodesian Selection	17/1½	+ 1/6
Rhokana	20½	+ ½
Rio Tinto	24½	— ½
Roan Antelope	14/3	+ 3d
Selection Trust	40/7½	+ 1/10½
Tanks	63/9	+ 6d
Tharsis Sulphur Br.	41/3	
TIN (Eastern)		
Ayer Hitam	27/-	— 6d
Bangrin	7/6	— 1½d
Gopeng	11/-	
Hongkong	8/9	+ 3d
Ipoh	18/-	— 9d
Kamunting	11/-	— 3d
Kepong Dredging	6/10½	+ 4½d
Kinta Tin Mines	13/9	— 3d
Malayan Dredging	25/4½	+ 4½d
Pahang	15/3	+ 1½d
Pengkalen	10/-	— 3d
Petaling	13/4½	— 1½d
Rambutan	13/-	
Siamese Tin	22/3	
Southern Kinta	16/-	+ 4½d
S. Malayan	26/4½	+ 4½d
S. Tronoh	12/-	
Sungei Kinta	19/-	
Tekka Taiping	8/3	— 3d
Tronoh	24/-	+ 3d
TIN (Nigerian and Miscellaneous)		
Amalgamated Tin	11/6	— 6d
Beralt Tin	27/10½	+ 3d
Bisichi	5/-	+ 1½d
British Tin Inv.	14/9	— 1½d
Ex-Lands Nigeria	4/6	— 1½d
TIN (Nigerian and Miscellaneous contd.)		
Geevor Tin	14/3	— 4½d
Gold & Base Metal	3/7½	+ 3d
Jantar Nigeria	13/3	
Jos Tin Area	10/9	+ 3d
Kaduna Prospectors	3/3	
Kaduna Syndicate	3/9	
London Tin	5/6	
United Tin	2/9 XD	— 3d
SILVER, LEAD, ZINC		
Broken Hill South	45/7½	
Burma Mines	1/10½	
Consol. Zinc	28/-	+ 3d
Lake George	14/9	
Mount Isa	39/6	+ 1/-
New Broken Hill	21/6	— 1/-
North Broken Hill	57/6	— 7½d
Rhodesian Broken Hill	14/3	+ 3d
San Francisco Mines	28/-	+ 2/9
Uruwira	4/-	+ 1½d
MISCELLANEOUS BASE METALS & COAL		
Amal. Collieries of S.A.	45/6	
Associated Manganese	53/3	— 6d
Cape Asbestos	21/1½	+ 1½d
C.P. Manganese	55/7½	+ 1/10½
Consol. Murchison	30/7½	— 4/4½
Mashaba	8d	
Natal Navigation	3 1/16	— 1/16
Rhod. Monteleo	10/6	
Turner & Newall	106/9	+ 1/9
Wankie	15/-	— 1½d
Witbank Colliery	60/-	
CANADIAN MINES		
Dome	$36½	+ 1
Hollinger	$29¾	
Hudson Bay Mining	$104	— 1
International Nickel	$79	— ¼
Mining Corpn. of Canada	£4 7/8	
Noranda	$141	— 1
Quemont	£6 7/8	
Yukon	4/7½	
OIL		
Anglo-Iranian	5 7/8	+ 1/32
Apex	41/3	
Attock	25/-	— 6d
Burmah	44/4½	+ 10½d
Canadian Eagle	32/7½	+ 10½d
Mexican Eagle	20/6	+ 1½d
Shell (bearer)	83/1½	+ 3/1½
Trinidad Leasehold	26/6	— 3d
T.P.D.	24/4½	— 1½d
Ultramar	24/-	— 1/-

COMPANY NEWS AND VIEWS

Messina's Impressive Results

Much new equipment, a big improvement in the output per native worker, together with a higher price for copper, were the chief factors enabling Messina (Transvaal) Development Company for the year to September 30 last to achieve an expansion in copper revenue by £653,624 to £3,073,577.

The addition of new equipment and the better output per native worker were reflected in the amount of copper ore sent to the mill which rose from 647,310 tons to 726,690 tons, an increase of 79,380 tons. The assay yield per ton was virtually the same as in the preceding year at 1.90 per cent cu. (1.89 per cent cu.) so that tonnage concentrates produced improved from 26,755 tons to 30,344 tons. But despite the greater tonnage of copper concentrates available for delivery to the smelter, the total amount of long tons of ingots produced showed a reduction from 11,190 tons to 10,615 tons, owing to a run-out of metal from the converting furnace. Nevertheless this must be regarded as merely a "technical hitch" for in other respects, the technical performance of the mine was impressive.

Owing to these favourable results net profit at £1,395,087 was an appreciable improvement over the preceding year's figure of £1,051,188. General reserve received £330,000 against £250,000 although an additional £80,000 was allocated to capital reserve in the preceding year. Shareholders received 370 per cent (280 per cent), the final dividend of 220 per cent being paid on a capital increased during the year from £250,000 to £325,000. The total distribution absorbed £1,090,000 compared with £700,000 previously. Although the total distribution was amply covered by current earnings, the allocation of £330,000 to reserves meant dipping into the carry forward which at the financial year-end stood at £8,947 compared with £33,860 brought in.

This reduction in the forward balance is, however, a small matter for net liquid assets at September 30 last amounted to £1,401,077 or well over four times the issued capital.

There is plenty of work for this capital. The company is continuing to modernize its plant wherever necessary; the nearby Artonvilla property is being opened up; and there is always the possibility that the company will be called upon to enlarge its already important stake in Rhodesia Copper Ventures.

With regard to the Artonvilla property, the potentialities of which appeared exceedingly bright in 1950 and 1951 on the basis of the estimated copper content of the ore *in situ*, its development by stoping operations during the year revealed that the ore bodies above the 500 foot level are neither as wide nor as rich as calculations based on level developments at first indicated. At the financial year-end total ore reserves at Artonvilla were estimated at 133,260 tons having a copper content of 2.81 per cent. While this is a perceptible drop in grade from earlier assessments which were given as 6.00 per cent cu. for 56,180 tons in 1950 and 4.01 per cent cu. for 158,640 tons in 1951, it is still as rich as any of the other sections of the mine.

Commander H. F. P. Grenfell is chairman. Meeting, Johannesburg, March 12.

Zams Profits Reduced

The preliminary profit statement of Zambesia Exploring Co. for the calendar year 1952 showed a sharp reduction in earnings, due in all probability to lack of opportunities during the year to effect profitable share transactions. The decline in the working profits of £74,710, though eased by a lighter taxation burden, still showed a fall in net earnings of £62,508 compared with 1951. Accordingly, shareholders' income was reduced by 5 per cent, and after meeting a charge of £3,574 in respect of U.K. taxation under-provided in previous years, the forward balance at the end of the year was some £42,000 less than that brought in.

Year to Dec. 31	*Working Profit*	*Tax*	*Net Profit*	*Dividend*		*Carry Forward*
	£	£	£	%	£	£
1952	91,899	62,798	29,101	15	68,145	53,602
1951	166,609	75,000	91,609	20	90,860	96,220

However, these disappointing results were partially offset by the large increase in net earnings of its wholly-owned subsidiary, Zambesia Investment Company, which was formed to look after the parent company's "reconstructed" holdings in Tanganyika Concessions. This Company's net profit figure of £38,668 compared with £24,045 and was struck after meeting tax liabilities of £36,871 against £26,228 in the preceding year. The forward balance was thus appreciably strengthened and at the financial year-end stood at £62,711 compared with £24,043 brought in.

Captain Rt. Hon. Charles Waterhouse is chairman. Meeting, March 18.

Oroville Dredging Earns More—Pays Same

The audited accounts of Oroville Dredging Company for the year to September 30 last, published in a preliminary statement, showed that profit before tax expanded by some £32,000. However, tax liabilities rose by over £30,000 so that the net profit remained virtually unchanged compared with the preceding year.

Year to Sept. 30	*Working Profit*	*Tax*	*Net Profit*	*Dividend*	*To Reserve*	*Carry Forward*
	£	£	£	%	£	£
1952	135,722	87,791	47,931	31¼	3,940*	112,781
1951	103,355	57,009	46,346	31¼	19,410†	109,806

* Transferred to Investment Reserve.

† Recovered in respect of shares previously written off and transferred to Investment Reserve.

The consolidated profits of Oroville Dredging and its subsidiary company, before tax, amounted to £183,225 compared with £121,337. Taxation required £128,856 (£78,571) and the minority's proportion was £36 (£21) leaving a net profit of £54,333 against £42,745. After providing for the dividend and the allocation to investment reserve the carry forward on consolidated account at the financial year-end was £126,528, an increase of £9,377 over the preceding year.

Annual meeting, March 19. Dividend will be payable on March 20. The accounts will be posted on February 23.

WILFLEY

JAW CRUSHERS

BALL MILLS

CONCENTRATING TABLES

CENTRIFUGAL SAND PUMPS

MACE SMELTING FURNACES · MACE SINTERING HEARTHS

THE WILFLEY MINING MACHINERY CO. LTD. Salisbury House, London, E.C.2

TELEPHONE MANSION HOUSE 1674 TELEGRAMS "WRATHLESS, LONDON"

Ariston Pays 30 per cent

With the recommendation of a final dividend of 20 per cent per 2s. 6d. stock unit making a total of 30 per cent, or 9d. per share, for the year ended September 30 last, Ariston Gold Mines, the important West African gold producer, raised its total distribution to shareholders by 5 per cent compared with the preceding year.

Year to Sept. 30	*Working Profit*	*Taxation*	*Net Profit*	*Dividend*	*To Reserve*	*Carry Forward*
	£	£	£	%	£	£
1952	409,228	253,787	170,321*	30	Nil	56,025
1951	332,424	177,387	160,536*	25	30,000	62,892

* Both years include an over-provision made in respect of the export duty on gold premium and gold duty. Over-provision in 1952 was £14,880 (1951—£5,499).

From the quarterly figures published, an improvement in Ariston's results was expected but even so the results now published in a preliminary statement make an impressive showing. Unfortunately, the chief beneficiary of the better results was the tax man whose offtake increased by £76,400. The 30 per cent distribution required £177,188 (£147,656) which involved drawing on the carry forward to a small extent.

Major-General W. W. Richards is chairman. Meeting March 16.

Consolidated Murchison's 1952 Results

Consolidated Murchison (Transvaal) Goldfields and Development has announced an estimated profit for the December quarter of last year of £47,048, including gold premium sales compared with £64,848 in the September quarter.

The results for the four quarters of 1952 are given in the following table.

Qtr. 1952	*Tons Crushed*	*Profit**	*Premium Revenue*	*Tax (Est.)*	*Net Profit*	*Capital Exp.*
		£	£	£	£	£
Mar.	36,065	479,572	724	128,000	352,296	50,898
June	22,267	97,066	830	16,000	81,896	36,281
Sept.	23,670	64,534	314	10,000	54,848	2,321
Dec.	19,984	46,299	749	7,000	40,048	3,024

*Estimated profit from antimony and gold.

On December 12 last it was reported that the company's total net profit after tax for 1952 was estimated at £522,500. But it is now stated that there will be an adjustment of £29,300 in the net profit shown in the annual report and accounts for the year to December 31, 1952, owing to a reduction "in the value of jute bag stocks on hand consequent upon a fall in the market price."

"Chartered" Grants Tinto Exclusive Prospecting Rights

The British South Africa Company has granted the Rio Tinto Company exclusive prospecting rights in two large areas of Northern Rhodesia. It is understood that one of the areas covers about 5,000 square miles and lies due south of the existing copper belt. The second area, which is south-east of the copper belt, covers about 1,200 square miles adjoining the border of the Belgian Congo.

Mining Men

Brig. E. H. L. Beddington has resigned from the board of Puket Tin Dredging.

Lt. Col. R. L. Broad, who is now permanently resident in South Africa, has joined the boards of New Union Goldfields and Merchants' Industrial Corporation and has been appointed chairman of each company.

Dr. J. H. Chesters, assistant director of research of the United Steel Companies, has been given the Robert W. Hunt Award for 1953 by the American Institute of Mining and Metallurgical Engineers. Dr. Chesters received the award for his paper entitled "Flow Patterns in Open-Hearth Furnaces" presented at the 1951 Conference at Cleveland, Ohio.

Mr. L. Gordon Darling has been appointed a director of Broken Hill Proprietary Company and of Australian Iron and Steel, following the resignation of Mr. H. B. Piner.

Commander R. G. A. Jackson, R.A.N., has been appointed special commissioner in charge of the preparatory commission for the Volta River Aluminium Scheme.

Mr. Thomas Pryor, Westbourne House, Saltash, Cornwall, has been appointed a director of South Crofty.

Mr. W. J. Wilcoxson has been appointed a director of Ipoh Tin Dredging and Sungei Kinta Tin Dredging.

OMCOL
The Trade Mark of
THE OAKLAND GROUP

OAKLAND METAL CO. LTD.

Buyers & Sellers
- Iron Ore
- Lead Ore
- Antimony Ore
- Zinc Ore
- Rutile
- Graphite
- Ilmenite
- Sillimanite
- Kyanite
- Asbestos Fibres
- Manganese Dioxide
- Industrial and Laboratory Chemicals
- Non-Ferrous Scrap and Residues
- SPECIALITIES—Complex Residues and Ores containing Tin, Nickel, Cobalt, Tungsten, Cadmium, etc.

A.O. METAL EXPORTERS LTD.

Shippers Exporters Importers
- Pig Iron
- Machinery
- Cycles and Accessories
- Hardware, Shoe Grindery
- Ship's Tackle
- Building Materials, Nails, Rivets, Tacks
- STEEL, ALUMINIUM, COPPER, BRASS
- & BRONZE in the following forms—
- Sheets (Flat and Corrugated)
- Angles, Joists
- Rounds, Tees
- Tubes, Strips

CEIRIOG METAL CO. LTD.

Manufacturers
- Aluminium Powders
- Aluminium Granules

All Offers and Enquiries to Administrative Offices—

94 NEW BOND STREET, LONDON, W.1

Cables: AMOMET, LONDON Phone: GROsvenor 5241-4

Metal Smelting and Refining Works:
OAKLAND WORKS, WILLINGTON, DERBYSHIRE

Aluminium Works:
FELLINGERRIG FACTORY, MACHYNLLETH, MONTGOMERYSHIRE

BRITISH TIN INVESTMENT CORPORATION

MR. ERNEST V. PEARCE'S STATEMENT

The annual general meeting of the British Tin Investment Corporation, Ltd., will be held on March 11 at Winchester House, Old Broad Street, London, E.C.

The following is the Statement by the chairman, **Mr. Ernest V. Pearce, A.Inst.M.M.,** circulated with the report and accounts:

The profit for the year ended December 31, 1952, amounted to £600,163, an increase of £22,396 on that of the previous year. After making full provision for taxation amounting to £392,389, there remains a balance of £207,774, which, with the balance brought forward from the 1951 accounts, makes available £297,908. Deducting the interim dividend of 5½ per cent paid less tax on August 20, 1952, which absorbed £60,784, there remains a balance of £237,124.

Last year I informed you that we had applied a portion of the profits realized on the sale of some of our investments towards writing down the balance-sheet value of one of our investments, i.e., an investment in a company having interests in Siam. Our interest in this company is included under the item "Securities not quoted." As we are still in a position of being unable to place a value on this investment, we have thought it prudent to apply a further £10,000 out of profits realized on the sale of some of our investments towards the writing down of the book value of the shareholding mentioned to a figure of £1.

Your directors recommend the payment of a final dividend of 13 per cent, less tax, which will absorb £143,672, and that the balance of £93,452 should be carried forward. If these recommendations are approved by members at the forthcoming annual general meeting, warrants will be posted on March 13.

EXCESS PROFITS LEVY

In July 1952 shareholders were notified that the Corporation would be liable to Excess Profits Levy. The taxation mentioned above includes a provision of £106,000, being 30 per cent on the excess profits as computed on the basis of the 1952 Finance Act. It is estimated that the overriding limit of 15 per cent on total taxable profits will reduce the amount actually payable for 1952 to about £96,000, but it has been considered desirable to provide the larger amount because the additional £10,000 may in certain circumstances have to be paid by the Corporation in a future year, if profits fall.

It is unnecessary for me to repeat the remarks regarding the impact on this Corporation of the Excess Profits Levy which were made in the circular sent to all members on July 28 last. I will, therefore, merely reiterate the manifest inequity of this tax so far as this Corporation is concerned and assure members that the Board is taking every possible step to obtain relief under the 1953 Finance Bill.

There have been only minor changes during the year in the Corporation's portfolio, the predominant portion of which, as I mentioned in my statement a year ago, consists of shares in tin mining companies.

I give below lists showing our principal investments in tin mining and miscellaneous mining companies:

Tin Mining Companies

Amalgamated Tin Mines of Nigeria Ltd.
Ayer Hitam Tin Dredging Ltd.
Kamunting Tin Dredging Ltd.
Larut Tin Fields Ltd.
London Tin Corporation Ltd.
Malayan Tin Dredging Ltd.
Pengkalen Ltd.
Petaling Tin Ltd.
Rahman Hydraulic Tin Ltd.
Rawang Tin Fields Ltd.
Southern Kinta Consolidated Ltd.
Southern Malayan Tin Dredging Ltd.
Southern Tronoh Tin Dredging Ltd.
Sungei Besi Mines Ltd.
Sungei Way Dredging Ltd.
Tekka Taiping Ltd.
Tronoh Mines Ltd.

Miscellaneous Mining Companies

Aluminium Ltd.
Anglo-Newfoundland Development Co., Ltd.
Associated Manganese Mines of South Africa Ltd.
British South Africa Co.
Consolidated African Selection Trust Ltd.
Consolidated Mining and Smelting Co. of Canada Ltd.
Consolidated Zinc Corporation Ltd.
De Beers Consolidated Mines Ltd.
Hollinger Consolidated Gold Mines Ltd.
Hudson Bay Mining and Smelting Co. Ltd.
Imperial Oil Ltd.
International Nickel Co. of Canada Ltd.
Lake George Mining Corporation, Ltd.
Messina (Transvaal) Development Co., Ltd.
Mining Corporation of Canada Ltd.
Mount Morgan Ltd.
Nchanga Consolidated Copper Mines Ltd.
Noranda Mines Ltd.
Rhodesia Broken Hill Development Co., Ltd.
Rhodesian Selection Trust Ltd.
San Francisco Mines of Mexico Ltd.

STEADY PRICES FOR TIN

The average price of Standard Tin on the London Metal Exchange during the year 1952 was £962, as compared with an average of £1,060 during the previous year and £736 in 1950. The main feature of the year was the remarkable steadiness in the price of Tin in contrast with substantial falls in the world prices of many other commodities, including several of the other leading non-ferrous metals. The steadiness was no doubt due in some degree to continued purchases of Tin by the American Government Stockpile, but none-the-less it seems clear that the gap between current output and current consumption is substantially less than was at one time feared.

As a matter of interest it can be recorded that the shipments of Straits Tin to the U.S.A. in 1952 amounted to 19,381 long tons as compared with 2,532 long tons in 1951.

I am pleased to say that all restrictions in the U.S.A. on the consumption of Tin have at last been removed. Now that American industry has been set free in this respect, it will be interesting to see what changes take place in that country's consumption of Tin. There are those who believe that the long period of restriction, which has now lasted for twelve years or more, may have had its long term effects. At the same time, it is difficult not to believe that the lifting of restrictions will result in some increase in consumption. I do not believe that the danger of the use of Tin substitutes should be over-exaggerated. I am confident that, so long as trade is brisk, there will be a steady demand for Tin which should be, to some extent, increased as soon as the new Tin alloys developed by the Tin Research Institute are commercially available.

POSITION IN MALAYA

It is a pleasant duty to say that from all the available reports, the security position in Malaya at last shows considerable signs of improvement. This improvement is undoubtedly due to the measures initiated by the Secretary of State for the Colonies—Mr. Oliver Lyttelton—when he visited Malaya at the end of 1951 and so energetically carried out by the present High Commissioner, Sir Gerald Templer. It is much to be hoped that the improvement will continue and will, before long, enable prospecting for Tin in Malaya to be resumed after a very long period. No words of mine are needed to stress the strategic importance both of such prospecting and of creating proper political and fiscal conditions to induce investors to venture their money in such new Tin-bearing areas as may be found. Tin is still one of our best "dollar earners" and there is no reason why, with reasonable foresight and encouragement from the proper quarters, it should not continue to be so. In spite of the conditions prevailing in Malaya since 1948, the production of Tin in concentrates in that country in 1952 was 56,800 tons, as compared with 57,200 tons in 1951 and 57,500 tons in 1950. These figures are excellent testimony to the skill, courage and devotion of all those in Malaya, particularly the Tin miners, who have had to stand the strains and anxieties of the last 4½ years.

As members are aware, the London and Singapore Markets for Tin, after their prolonged war-time closure, have now been open for more than three years. I should like to record my view of the useful services rendered by these markets, not only to the Tin Producers of the world but to the Tin Industry in general.

TIN RESEARCH

A year ago I referred to the appeal made by the Tin Research Institute to all its contributory Tin producing countries for an increase in their annual contributions. I am glad to say that all the countries concerned duly agreed to the request made to them and that, as a result, the Tin Research Institute is now in a better position to extend its activities not only in this country but in other appropriate parts of the world.

GOLD COAST SELECTION TRUST

The twenty-third annual general meeting of Gold Coast Selection Trust, Ltd., was held on February 13 in London.

Major-General W. W. Richards, C.B., C.B.E., M.C., chairman of the company, presided.

The following is an extract from the statement of the Chairman which was circulated with the report and accounts for the year ended September 30, 1952:—

Briefly summarizing the accounts it will be seen that £110,630 was received by way of dividends and interest, and share transactions yielded a profit of £2,357. The profit for the year is £83,517—approximately the same figure as last year.

In November, 1952, an interim dividend of 5 per cent., less tax, was declared, and the directors now recommend the payment of a final dividend of 7½ per cent., making 12½ per cent. distributed for the year under review.

The stock and share markets have continued in a state of apathy. The shares in the West African companies in which our interests are so largely represented are, undoubtedly, intrinsically worth considerably more than the values placed upon them by present day market quotations.

The companies in which we are interested are Ariston Gold Mines, Amalgamated Banket Areas, Bremang Gold, Gold Coast Main Reef and Marlu Gold Mining. The holdings in companies operating in the Gold Coast still represent some 93 per cent. of the aggregate of the investments. The Gold Coast Government authorized the mines to sell as from May, 1952, their whole production of gold on the "free" market. This concession surpasses the previous authority given in October, 1951, to sell only 40 per cent. free of restriction.

The "free" market price to-day represents an additional revenue to producers of some 20s. per ounce.

The gold-mining industry is, without doubt, an integral part of the welfare and prosperity of the Gold Coast Colony and should, we feel, be given every consideration for its future development.

The tin companies in which we have acquired share interests are all paying handsome dividends. These investments will, we feel sure, prove useful sources of revenue for many years to come.

The report and accounts were adopted.

ALPINE (BARBERTON) GOLD MINE LTD.

The following is an extract from the Chairman's Statement:

Shareholders were warned in my statement a year ago that the year to 30th June, 1952, would be a critical one, during which the Mine was unlikely to do more than barely hold its own. It was, in fact, a year of unrelieved anxiety. It was found increasingly difficult to bring payable ore to the Mill, and the recovery per ton milled declined throughout the year. The revised development programme agreed upon in 1951 lagged behind scheduled time.

In the result a slightly increased tonnage of ore milled produced a slightly reduced quantity of gold. After paying for development the working loss is £3,424 and the Company's total loss for the year is £9,420.

The increase in the figure for Creditors is accounted for by the fact that payment of their remuneration to Directors, General Managers and Secretaries has been suspended since 1st October, 1951. In spite of this it will be apparent that the Company's cash resources at 30th June, 1952, were reduced to a minimum.

There are some grounds for hoping that 30th June, 1952, was the low watermark date in the Company's fortunes. Since that date the development programme has made satisfactory progress. The recovered grade between June and November, 1952, has consistently advanced from 3.45 dwt. to 6.16 dwt. per ton milled. The 21st Level is now ready for stoping. This improvement has not yet been fully reflected in the monthly figures but has provided the means for increased expenditure both on development and on arrears of maintenance work in the mine. The Company has also acquired and installed a pump which has enabled the pumping system underground to be improved and a winch which enables an increased quantity of ore to be hauled from the deeper levels to the bottom of the main shaft at 18th level.

Your Board have thought it necessary that the immediate cash resources of the Company should be strengthened and have accordingly arranged for a loan to the Company of £5,000 secured on the Company's assets in South Africa.

It is the intention of your Board, if circumstances warrant it, to extend the Main Shaft from the 18th Level downwards. For this a new hoist will be required and one has been secured.

ABELSON & CO. (ENGINEERS) LTD.

Specialists in the supply of used and reconditioned plant and machinery including Tractors, Bulldozers, Scrapers, Excavators, Cranes, Locomotives, Rails, Wagons, Pumps, Compressors, Diesel Engines, Alternators, Motors, and all other types of plant used by Civil Engineers, Mining Engineers and Industrial Undertakings.

Your enquiries are welcomed

Head Office:
Coventry Road, Sheldon, Birmingham
Telephone: Sheldon 2424
Cables: Abelson Birmingham

London Office:
70, Victoria Street, London, S.W.1
Telephone: Tate Gallery 9444-8

Manchester Office:
100, Oxford Road, Manchester, 13
Telephone: Ardwick 1328

Wherever there's Mining machinery CLEANING RAGS ARE VITAL.

We supply Washed and Graded Cleaning and Polishing Rags, Cotton Waste, Stockinette, etc., for all types of machinery and allied purposes.

Can we quote for your requirements?

E. AUSTIN & SONS (LONDON) LTD.
ATLAS WHARF · HACKNEY WICK · LONDON, E.9
Telephone: AMHerst 2211

CONSOLIDATED MURCHISON (TRANSVAAL) GOLDFIELDS AND DEVELOPMENT COMPANY, LIMITED

(Incorporated in the Union of South Africa)

Directors' Report for the quarter ended 31 December, 1952

The following is the report on the work done during the quarter ended December 31, 1952:—

Tons crushed	19,984
Estimated Profit from Antimony and Gold	£46,299
Estimated Taxation	£ 7,000

In addition, revenue of £749 was received during the quarter in respect of increased revenue from sales of gold at higher than standard prices.

There will be an adjustment of £29,300 in the net profit shown in the Annual Report and Account for the year ended December 31, 1952, being a reduction in the value of Jute Bag Stocks on hand consequent upon a fall in the market price.

The capital expenditure during the period amounted to £3,024.

During the quarter the development footage accomplished amounted to 487 feet.

Of this, 45 feet were accomplished in the ore body, of which 40 feet were sampled and found to be payable on account of the combined gold and antimony content.

The remaining 442 feet were accomplished in a lens known to carry gold values only. 350 feet were sampled and proved to be unpayable, giving an average value of 2.64 dwts. per ton over a width of 68 inches.

In determining the payable footage the prices of gold and antimony, as at December 31, 1952, have been used.

The development figures mentioned above are the actual result of the sampling of development work in the ore body; no allowance has been made for modifications which may be necessary when computing the ore reserves.

By Order of the Board,
ANGLO-TRANSVAAL TRUSTEES LIMITED,
LONDON SECRETARIES
I. C. H. GLASS,
Secretary.

WIGAN AND DISTRICT MINING AND TECHNICAL COLLEGE

The Governing Body invites applications for a post as LECTURER IN THE DEPARTMENT OF MINING AND GEOLOGY. Duties commence on April 1, 1953, or as soon as possible thereafter.

Candidates should hold a degree in Mining and a Statutory Certificate. Salary in accordance with the Burnham Technical Scale for Lecturers (£940—£25—£1,040).

Further particulars and application form will be sent by the undersigned on receipt of a stamped addressed foolscap envelope. Last date for receipt of applications: Monday, March 9, 1953. Applications not on the form provided will be disregarded.

February 12, 1953.

E. C. SMITH,
Principal.

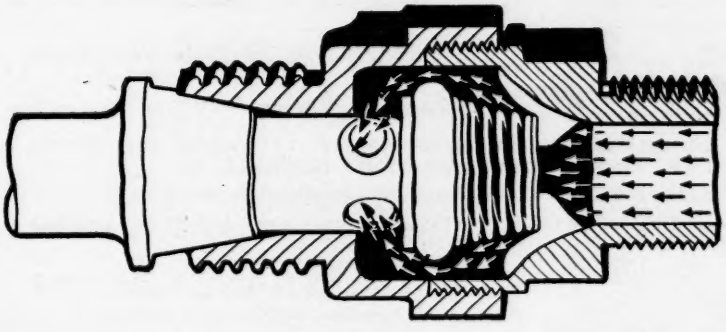
NATIONAL COAL BOARD invite applications for a superannuable appointment as Head of the Standardisation Section in the Engineering Branch of Production Department at London Headquarters. Salary range £1,100 to £1,550 inclusive, according to qualifications and experience.

Candidates should preferably be Mechanical Engineers who have had Drawing Office experience and/or experience in Standardisation work. Some commercial experience would be an advantage.

Write, giving full particulars (in chronological order) of age, education, qualifications and experience (with dates) to National Coal Board, Establishments (Personnel), Hobart House, Grosvenor Place, London, S.W.1, marking envelope TT/599. Original testimonials should NOT be forwarded. Closing date April 14, 1953.

RATCHET TYPE 5-TON LIFTING JACKS. As used in National Mines and industries now available for immediate delivery. All steel construction. Robust design incorporating forged racks and pawls. 4 ft. steel lifting bar. Guaranteed 5-ton lift on head or tow. Weight of Jack 36 lb. Price £10 5s. 0d. ex works. Usual trade terms. Write Rotary Hoes Ltd., 903 Station Road, Horndon, Essex, England.

D.P. AUTOMATIC VALVES

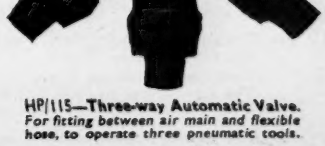


D.P. Automatic Valves are used in all cases where compressed air is supplied to pneumatic tools. Taking the place of air cocks (with all their disadvantages) they are entirely automatic in action and make leaks and air waste impossible. Besides the advantage of a general air saving with increased tool performance, the air supply is automatically cut off immediately the tool is disconnected from the hose. No struggling with refractory air cocks to shut off air supply—no projecting air cocks to suffer damage. D.P. Automatic Valves are simple, robust and need no attention.

HP/117—**Single Automatic Valve,** for use between air main and flexible hose, or between flexible hose and pneumatic tool.

"D.P." (Cadmium coated) — **Single Automatic Valve,** similar to No. HP/117, but of lighter construction. Used mainly for fitting between air hose and pneumatic tool.

H.P./116 — **Double Automatic Valve** For fitting between air main and flexible hose and to operate two pneumatic tools.



HP/115—**Three-way Automatic Valve.** For fitting between air main and flexible hose, to operate three pneumatic tools.

dollery and palmer LIMITED

38 VICTORIA STREET · LONDON · S.W.1 *Telephone:* ABBey 7166 (2 lines)

Cables: Deflection, Sowest, London

D.P.17

Metal and Mineral Trades

THE ANGLO CHEMICAL & ORE COMPANY LIMITED

PALMERSTON HOUSE, BISHOPSGATE, LONDON, E.C.2

IMPORTERS & EXPORTERS

Minerals · Ores · Residues · Chemicals

Non-Ferrous Metals & Scrap

Telephone :
LONDON WALL 7255 (5 Lines)

Telegrams :
CHEMORE, LONDON

CONSOLIDATED TIN SMELTERS, LIMITED.

ST. SWITHIN'S HOUSE, 11/12 ST. SWITHIN'S LANE, LONDON, E.C.4

Telephone: MANsion House 2164/7 *Telegrams: CONSMELTER, PHONE LONDON*

PROPRIETORS OF THE FOLLOWING BRANDS OF LAMB & FLAG AND STRAITS TIN

ENGLISH (COMMON & REFINED) — CORNISH, MELLANEAR, PENPOLL

STRAITS E. S. COY., LTD., PENANG

BUYERS OF ALL CLASSES OF TIN ORES

Sole Selling Agents: VIVIAN, YOUNGER & BOND, LIMITED

PRINCES HOUSE, 95 GRESHAM STREET, LONDON, E.C.2 *Telephone:* MONarch 7221/7

Established 1797 *Members of the London Metal Exchange*

DERBY & Co., Ltd.

Specialists in	WOLFRAM, SCHEELITE, CHROME, MOLYBDENITE, TANTALITE, COLUMBITE RUTILE, ILMENITE, BERYL, ZIRCON AND OTHER MINERALS.
Smelters and Refiners of	GOLD, SILVER, PLATINUM, PALLADIUM, OSMIUM, IRIDIUM, ETC.
Buyers of	MINERALS, ORES, CONCENTRATES, SWEEPS, LEMELS AND RESIDUES containing GOLD, SILVER, PLATINUM, COPPER, TIN, ZINC, LEAD.

Smelting and Refining Works:
BRIMSDOWN, MIDDLESEX

City Office: 11-12 ST. SWITHIN'S LANE, E.C.4
Telephone: AVENUE 5272 (20 lines)

Also at NEW YORK — ADELAIDE — JOHANNESBURG

Cable Address: WAHCHANG, NEW YORK

WAH CHANG CORPORATION

(FORMERLY WAH CHANG TRADING CORPORATION)

233 BROADWAY - - NEW YORK 7, NEW YORK

TUNGSTEN TIN

BUYERS	SELLERS
Tungsten Concentrates, Tungsten Tin Concentrates	Tungsten Concentrates to Buyers' Specifications
Mixed Tungsten Ores	Tungsten Salts, Tungsten Powder
Tungsten Tailings, Scrap, Tips, Grindings	Tungsten Rods and Wires
Tin Concentrates—Tin Dross, Tin Furnace Bottoms	Tin Ingots, Tin Oxides, Tin Chlorides

PLANT—GLEN COVE, NEW YORK

GEORGE T. HOLLOWAY
& CO. LTD.

METALLURGISTS & ASSAYERS,
ORE TESTING, WORKS AND
METALLURGICAL RESEARCH LABORATORIES

Atlas Road, Victoria Road, Acton,
LONDON N.W.10

Telephone No.: ELGAR 5202
Tels. & Cables: NEOLITHIC LONDON

THE ANGLO METAL COMPANY LIMITED
2 & 3, CROSBY SQUARE,
LONDON, E.C.3
(Members of the London Metal Exchange)

NON-FERROUS METALS
ORES & CONCENTRATES
BULLION

Telephone: LONDON WALL 6341 (Private Branch Exchange)
Telegrams: NUCLIFORM PHONE LONDON
Cables: NUCLIFORM, LONDON

Telegrams: "BASSETT, PHONE, LONDON."
Telephone: MANSION HOUSE 4401/3.

BASSETT SMITH & Co. Ltd.
(Incorporating George Smith & Son)
15/18 LIME ST., LONDON, E.C.3

METALS,
ORES (Copper, Zinc, Lead, &c., Complex),
RESIDUES, SKIMMINGS & ASHES
NON-FERROUS SCRAP

Cables: AYRTON—NEW YORK Telephone: CIRCLE 6—7667
AYRTON METAL COMPANY
30 ROCKEFELLER PLAZA INC. NEW YORK
Members of Commodity Exchange, Inc., American Tin Trade Association, Inc.
IMPORTERS OF
WOLFRAM — MANGANESE
CHROME—ANTIMONY ORES
DEALERS IN
PLATINUM — GOLD — SILVER
Buyers of crude platinum
U.S. Agents for
AYRTON METALS LTD. 10—13 Dominion St. London, E.C.2
MEMBERS OF THE LONDON METAL EXCHANGE

BARNET NON-FERROUS METAL CO., LTD.
Elektron House, Vale Drive, Barnet, Herts. Phone: Barnet 5187 and 3901
STOCKISTS OF : Aluminium, Brass and Copper
BUYERS OF : all non-ferrous scrap
The RIGHT firm to deal with

RHONDDA METAL CO. LTD.
1 HAY HILL, BERKELEY SQ. LONDON, W.1
Works: PORTH, GLAM.
PHOSPHOR COPPER
PHOSPHOR BRONZE, LEAD BRONZE,
GUNMETAL, BRASS
Telephone: MAYFAIR 4654 Cables: RONDAMET

WOLFRAM ORE
TIN ORE

FELIX KRAMARSKY CORPORATION
39 BROADWAY
NEW YORK 6, N.Y.
Cable Address: Orewolfram

A. STRAUSS & CO. LTD.
FOUNDED 1875
PLANTATION HOUSE, MINCING LANE, E.C. 3
Telephone: Mincing Lane 5551

MERCHANTS, EXPORTERS, IMPORTERS
NON-FERROUS METALS
SCRAP RESIDUES
METAL REFINERS
Members London Metal Exchange

ESTABLISHED 1869
BLACKWELL'S
METALLURGICAL WORKS LTD.
THERMETAL HOUSE, GARSTON, LIVERPOOL 19

MAKERS OF
FERRO ALLOYS, NON-FERROUS ALLOYS
RARE METALS

BUYERS AND CONSUMERS OF
COLUMBITE TANTALITE, TUNGSTEN
MANGANESE and all ORES.

Works, Garston. Telegrams: Blackwell, Liverpool

EVERITT & Co. LTD.
40 CHAPEL STREET
LIVERPOOL
Teleg. Address: Persistent, Liverpool Phone: 2995 Central

SPECIALITY:
MANGANESE PEROXIDE ORES

We are buyers of:
WOLFRAM, SCHEELITE, VANADIUM,
MOLYBDENITE, ILMENITE, RUTILE,
ZIRCONIUM and TANTALITE ORES

Suppliers of:
FERRO-ALLOYS & METALS, NON-FERROUS ALLOYS

Telephone : AMHERST 2211 (six lines)

E. AUSTIN & SONS

(London) LIMITED

ATLAS WHARF
Hackney Wick, London, E.9

Are Buyers of all scrap
NON - FERROUS METALS, GUNMETAL, ALUMINIUM, COPPER, BRASS, LEAD, Etc.

Manufacturers of
INGOT BRASS, GUNMETAL & COPPER ALLOYS, INGOT LEAD, TYPE METAL, ZINC, Etc.

MINING & CHEMICAL PRODUCTS, LTD.

MANFIELD HOUSE, 376, STRAND, W.C.2
Telephone: Temple Bar 6511/3 Works: ALPERTON,
Telegrams: "MINCHEPRO, LONDON" WEMBLEY, MIDDLESEX

Buyers of Silver Ores and Concentrates

Smelters and Refiners of
BISMUTH
ORES, RESIDUES & METAL

Manufacturers of:
FUSIBLE ALLOYS, SOLDER, WHITE METALS, ANODES OF TIN, CADMIUM and ZINC IN ALL SHAPES

Importers and Distributors of:
ARSENIC · BISMUTH · CADMIUM
INDIUM · SELENIUM · TELLURIUM

S. J. BARNETT & Co. Ltd.

GREENWICH HOUSE,
10/13, NEWGATE STREET, LONDON E.C.1
Telephone: City 8401 (7 lines)

ORES - METALS - RESIDUES

METAL TRADERS LTD.

7 GRACECHURCH ST., LONDON, E.C.3
Telegrams: Serolatem, Stock, London
Telephone; MANsion House 7275/6/7

Buyers and Sellers of
NON-FERROUS METALS
ORES AND MINERALS

New York Representative:
Metal Traders Inc., 67 Wall Street

BROOKSIDE METAL CO. LTD.

(Owned by Metal Traders Ltd.)
HONEYPOT LANE, STANMORE, MIDDX.
Telegrams: Aluminium, Stanmore
Telephone: EDGware 1646/7

Buyers and Sellers of
ALL NON-FERROUS METALS
Specialists in ALUMINIUM

THE STRAITS TRADING
COMPANY LIMITED

Head Office:
P.O. Box 700, OCEAN BUILDING, SINGAPORE

Works:
SINGAPORE & PENANG

"The Straits Trading Co., Ltd."
Brand of Straits Tin

THE BRITISH TIN SMELTING
COMPANY, LIMITED

Works: LITHERLAND, LIVERPOOL

Smelters of Non-ferrous Residues and Scrap

London Agents:
W. E. MOULSDALE & CO., LTD.
2 Chantrey House, Eccleston Street, London, S.W.1
Cables: Wemoulanco, London *Telephone:* SLOane 7288/9

METAL SUPPLIES Ltd

SUPPLIERS OF
PHOSPHOR COPPER
PHOSPHOR TIN
FERRO ALLOYS
METALLIC CARBIDES & POWDERS
LEAD PRODUCTS
AND ALL OTHER NON-FERROUS METALS

72 VICTORIA ST. LONDON S.W.1

'Phone: VICTORIA 1735 (3 lines). 'Grams: METASUPS, WESPHONE

Consult
JOHN DALE
LIMITED
about Aluminium Alloy Gravity Die Castings

DEPT. TS.7., LONDON COLNEY, ST. ALBANS, HERTS.
Telephone: Bowmansgreen 2266

ALFRED HARRIS & Co. (Richmond) Ltd.
FOR ALL SCRAP METALS
Specialities:—
NICKEL MOLYBDENUM TUNGSTEN
MANOR PARK, RICHMOND, SURREY *Phone: 0028*

P. & W. MACLELLAN LTD.
129 TRONGATE, GLASGOW
NON-FERROUS METALS all classes
INGOT SCRAP MANUFACTURED
Letters: P.O. Box 95 Glasgow
Telegrams: Maclellan, Glasgow *Telephone:* Bell 3403 (20 lines)

S. J. READ & SONS (Scrap) LTD.
Scrap Metals of all descriptions Bought
Highest Market Prices Offered for LEAD (Any Quantities)
12-14 LOAMPIT HILL, LEWISHAM, S.E.13
Telephone - - - - - - TIDEWAY 3452 or 3764
Also at 21a WILLSHAW STREET, NEW CROSS, S.E.14
Telephone - - - - - - - TIDEWAY 3553

STEN A. OLSSON
HANDELS A/B : GOTHENBURG (Sweden)
NON-FERROUS METALS
SCRAP—INGOTS—SEMIS
IRON — STEEL
BARS—SHEETS—PLATES—WIRE RODS
TINPLATE :: PIGIRON
Import *Export*
P.O. Box 207 *Cables:* Olssonmetall *Telephone:* 192035

CUPELS
MAGNESIA CUPELS and ASSAY MATERIAL "MABOR" BRAND, as supplied to MINTS, MINES and ASSAYERS throughout the World.
MABOR (1944) LIMITED
(Founded 1900)
THE PIONEERS OF MAGNESIA CUPELS
Registered Office: 310 Winchester House, London, E.C.2
Phone: London Wall 5089 *Tel. Address.* Maborlim, London
Agencies: SALEM, INDIA: MONTREAL, CANADA: PERTH, W.A.
Supplies through Agents, the Trade, or direct.

ESSEX METALLURGICAL
(F. L. Jameson, A.M.I.M.M.)
Assayers and Samplers
On London Metal Exchange List of assayers and samplers
Laboratories and Offices:
13 Woodhouse Grove, London, E.12
Telephone: GRAngewood 4364
Grams: Assaycury, Forgate, London *Cables: Assaycury, London*

THE BRITISH METAL CORPORATION LTD.
BMC
LONDON . MONTREAL . TORONTO . VANCOUVER
SYDNEY · PERTH · MELBOURNE
CALCUTTA · BOMBAY · KARACHI
LAHORE · JOHANNESBURG · BULAWAYO
ASSOCIATES:
C. TENNANT., SONS & CO. OF NEW YORK, NEW YORK.
VIVIAN YOUNGER & BOND LIMITED, LONDON AND NIGERIA.
HENRY GARDNER & CO. LIMITED, LONDON, CANADA AND MALAYA.
The Group trades in and markets non-ferrous ores, metals and minerals, many kinds of produce, timber and other materials; it provides coal-washing plant, ventilation plant and other specialist engineering equipment; and it furnishes allied shipping, insurance, secretarial, financial, technical and statistical services.
PRINCES HOUSE
93 GRESHAM STREET, LONDON, E.C.2
TELEGRAMS: *Brimetacor, London* CABLES: *Brimetacor, London* TELEPHONE: *MONarch* 8055
Branches at BIRMINGHAM and SWANSEA

Telegrams: NONFERMET TELEX, LONDON
Cables: NONFERMET LONDON
Telephone: MANSION HOUSE 4521 (10 lines)
HENRY GARDNER & CO. LTD.
Non-Ferrous Metals and Semi-Manufactures.
Ores, Minerals and Residues,
Rubber
Iron and Steel
and General Merchandise
2 METAL EXCHANGE BUILDINGS
LONDON, E.C.3
and at BIRMINGHAM, MANCHESTER and GLASGOW

EASING THE MINER'S BURDEN . . .

CP equipment incorporating the latest techniques for the use of compressed air in mining, answers the call for **increased** production with **reduced** operator fatigue. Consider three items — the 327CL coal drill, a tool in which constant development has allied immense power with really light weight . . . the CP "Feedleg" — a pneumatic support for stone drills which entirely takes the load from the driller and, in conjunction with CP light rock drills and tungsten tipped rods, establishes entirely new standards of efficiency . . . the FL18W wet pick, a tool with a mist spray to reduce dust — yet another of the miner's traditional burdens. Yes! . . . for the very latest in mining equipment, it pays to . . .

CALL IN CONSOLIDATED

CONSOLIDATED PNEUMATIC TOOL CO. LTD. • LONDON & FRASERBURGH

Offices at Glasgow • Newcastle • Manchester • Birmingham • Leeds • Bridgend • Belfast • Dublin • Johannesburg
Bombay • Melbourne • Paris • Rotterdam • Brussels • Milan • and principal cities throughout the world CP113

Published by The Mining Journal Ltd., 15 George St., London, E.C.4, and printed by Washburn & Sons Ltd., 25-27 Queens Road, Southend-on-Sea, Essex. Registered as a Newspaper.